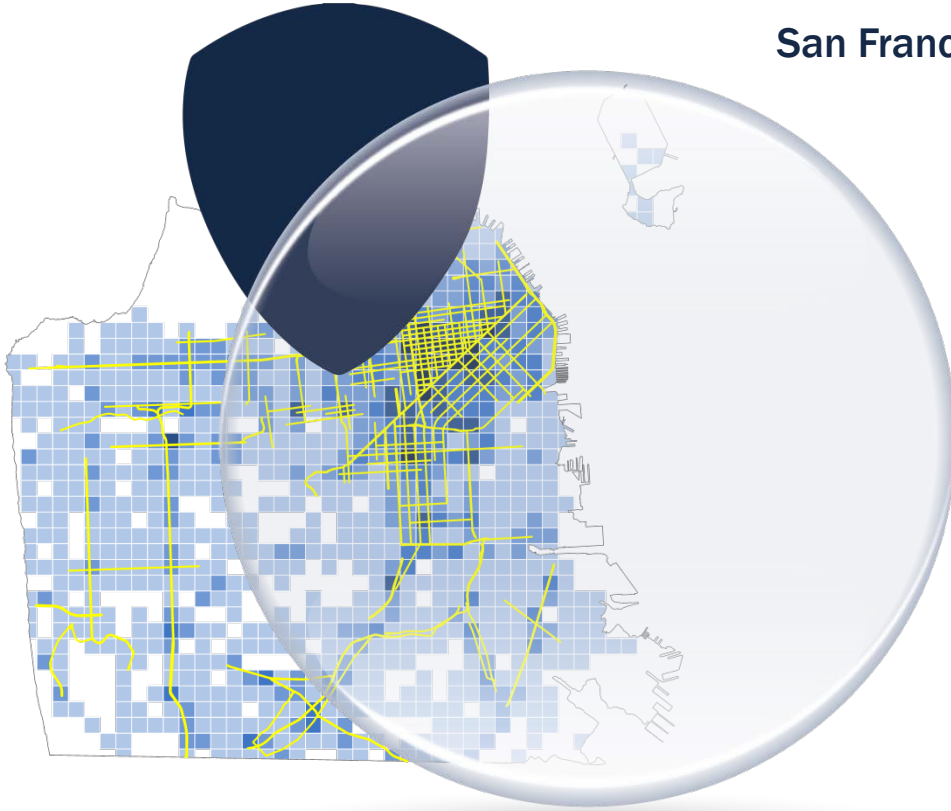


# Focus on Enforcement

Insights from research and analysis in support of San Francisco's Vision Zero plan to eliminate traffic deaths



Joe Lapka  
Corina Monzón  
Peg Stevenson

**3/10/2017**

# Acknowledgments

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Thanks to all who work each day to improve the safety and accessibility of our transportation system, and special thanks to those below whose guidance, insight, and cooperation contributed greatly to this report.

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**In memory of Priscilla "Precy" Moreto**

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# About the Controller's Office

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The City Services Auditor (CSA) was created in the Office of the Controller through an amendment to the Charter of the City and County of San Francisco (City) that was approved by voters in November 2003. CSA is comprised of two units – Audits and City Performance. Under Appendix F to the Charter, CSA has broad authority to:

- Report on the level and effectiveness of San Francisco's public services and benchmark the City to other public agencies and jurisdictions.
- Conduct financial and performance audits of city departments, contractors, and functions to assess efficiency and effectiveness of processes and services.
- Operate a whistleblower hotline and website and investigate reports of waste, fraud, and abuse of city resources.
- Ensure the financial integrity and improve the overall performance and efficiency of city government.

**For more information, please contact:**

Corina Monzón  
Office of the Controller  
City and County of San Francisco  
(415) 554-5003 | [corina.monzon@sfgov.org](mailto:corina.monzon@sfgov.org)

or

Joe Lapka  
Office of the Controller  
City and County of San Francisco  
(415) 554-7528 | [joe.lapka@sfgov.org](mailto:joe.lapka@sfgov.org)

**To download the report, visit:**

<http://sfcontroller.org/>

**To access the district collision maps, visit:**

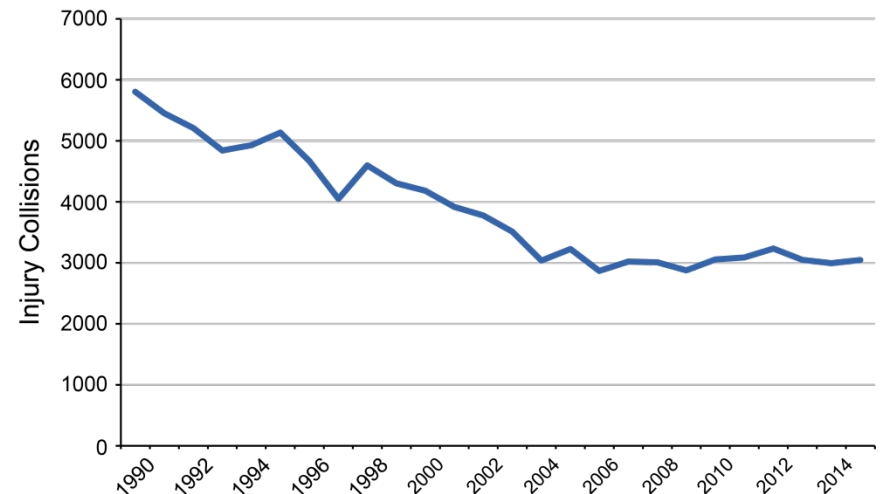
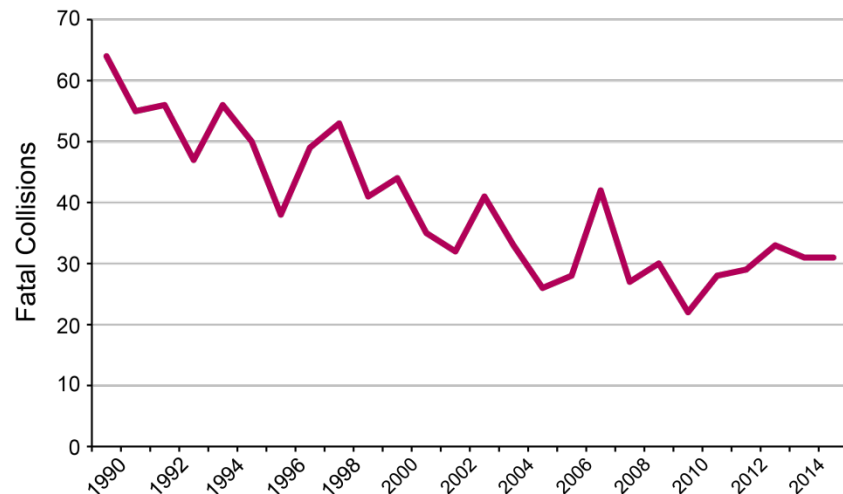
<http://sfcontroller.org/collisiondata>

According to data from the National Highway Traffic Safety Administration’s National Center for Statistics and Analysis (2016, August), 35,092 people lost their lives in crashes on US roadways in 2015. Although fatalities are down nationally from more than 42,000 ten years ago, the total in 2015 represents an increase of 7.2% over the previous year and this is the largest per-centage increase in nearly 50 years. Even more troubling, the numbers for the first six months of 2016 show an even higher increase (10.4%) from the comparable period in 2015. Locally, the statistics are just as concerning. A recent report from the San Francisco Municipal Transportation Agency (SFMTA) shows that the number of fatal and injury collisions has stagnated since around 2004 following steady decreases throughout the 1990s and early 2000s. Approximately 30 people continue to die on San Francisco’s streets each year and hundreds more are severely

injured. These deaths and injuries are both unacceptable and preventable.

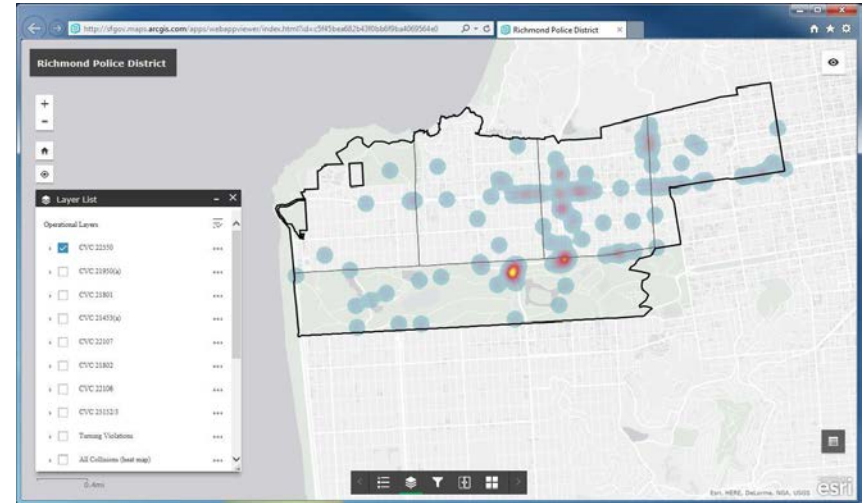
Adopted in 2014, the Vision Zero policy represents the City’s commitment to build safer streets, educate the public on traffic safety, enforce traffic laws, and implement other changes to eliminate traffic deaths by 2024. As we reaffirm our commitment to safe streets through the development of a new two-year plan, now is an opportune time to think critically about what can be done to set the number of fatal and injury collisions back on their downward trend. Accordingly, this report considers how the San Francisco Police Department (SFPD) may refine how it deploys its traffic enforcement resources in support of Vision Zero and how it measures its progress in that regard.

**Fatal and Injury Collisions in San Francisco (1990 – 2015)**



Data source for charts: Adapted from SFMTA (2016)

Performed at the request of the SFMTA, the SF Department of Public Health (DPH), and the SFPD, this analysis seeks to further understand the conditions and factors that have led to traffic-related injury and death in San Francisco. It draws on a wide body of research, which shows that high visibility enforcement is an effective way to deter dangerous, and often deadly, road behaviors, and it utilizes the most recent collision data available (2013-2015) to consider how the SFPD can enhance the deterrent effect by varying the location and the nature of its enforcement operations. We also highlight a variety of effective enforcement strategies and we discuss traffic enforcement in relation to important issues like procedural justice and social equity. Based on our research and analysis, we offer the nine recommendations summarized on the following two pages. The first of these recommendations is that the SFPD attempt to expand its enforcement presence beyond the High Injury Network in order to deter dangerous road user behavior to the greatest extent possible. In an effort to balance this recommendation with the practical reality that the SFPD must still target its limited resources on select locations to some degree, we have created an online resource that can assist the SFPD in selecting alternative enforcement sites in a data driven manner. Additionally, other City staff and the public may also use these maps to explore the collision data in greater depth and identify locations that may benefit from interventions other than enforcement. This online application includes maps that identify the top collision factors in each police district and the locations in each district where those collisions have occurred in the last three years. To access the data, visit <http://sfcontroller.org/collisiondata>.



## Recommendations:

1. The SFPD should seek out opportunities to extend its enforcement presence beyond the HIN so as to create the impression among the driving public that violations of the law, wherever they occur, will be detected. The selection of alternative sites should be data driven and should consider vulnerable populations at sites such as schools and senior centers. The online collision maps we have developed as a companion to this report can be used for such a purpose.
2. The SFPD should modify its Focus on the Five strategy so that it is better suited to the unique environment of each police district and allows for an appropriately varied response to the problem of traffic collisions. We recommend structuring the goal such that:
  - a) each district is individually responsible for meeting its own district-based target; and
  - a) the districts are jointly responsible for a department-wide goal (i.e., 100% of the districts should meet their target each month).
3. In implementing the recommendations of the Department of Justice, the SFPD should utilize the City's Vision Zero Action Strategy as a framework for working collaboratively with the community to understand traffic violence and jointly develop strategies to address it. As appropriate, the SFPD may additionally consider incorporating specific community concerns into its Focus on the Five goals.
4. The SFPD should develop and publicly report on measures related to procedural justice and social equity in traffic enforcement.
5. Consistent with our recommendations that the SFPD broaden the spatial extent of its traffic enforcement activities and the range of illegal behaviors on which it focuses, the SFPD should similarly ensure that the temporal scope of its operations is sufficient to deter illegal driving behaviors at all times throughout the day and over the course of a week.
6. The SFPD should consider the feasibility of measuring the level of effort it dedicates to traffic enforcement if it wishes to further explore the relationship between the level of policing and the rates of traffic collisions or violations in San Francisco.
7. In evaluating the Safe Speeds SF campaign, the City should not only evaluate its effectiveness in reducing average vehicle speeds and the number of speeding vehicles, but it should also evaluate its impact on the SFPD's resources and consider how sustainable the program is over the long term.

*continued on next page...*

## Recommendations:

8. In light of scientific research which shows that effective traffic enforcement programs should be based on proactive rather than reactive measures, and given the proven efficacy of automated speed enforcement in preventing fatal and serious injury collisions, the City and County of San Francisco should continue to advance the use of automated speed enforcement as a tool for encouraging people to drive at safe speeds.
9. The SFPD should work quickly to implement its eCitation and eStops initiatives, which will enable officers to issue citations electronically and provide for the electronic collection of data on the race and ethnicity of those who are stopped. In implementing these initiatives, the SFPD should work with its Vision Zero partner agencies to ensure the new systems will support quality data analyses.

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## Deterrence Theory

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## The Haddon Matrix

The Haddon Matrix is a model of the human, environmental, and vehicular factors that define the frequency and severity of traffic injuries. The model divides the crash sequence into three phases; the grid cells at the intersection of each crash phase and collision factor represent different opportunities to prevent traffic collisions or mitigate their impacts.

This model highlights the importance of a comprehensive systems approach to preventing traffic fatalities, and it clearly illustrates the important role that enforcement has in encouraging safe behavior on the part of road users.

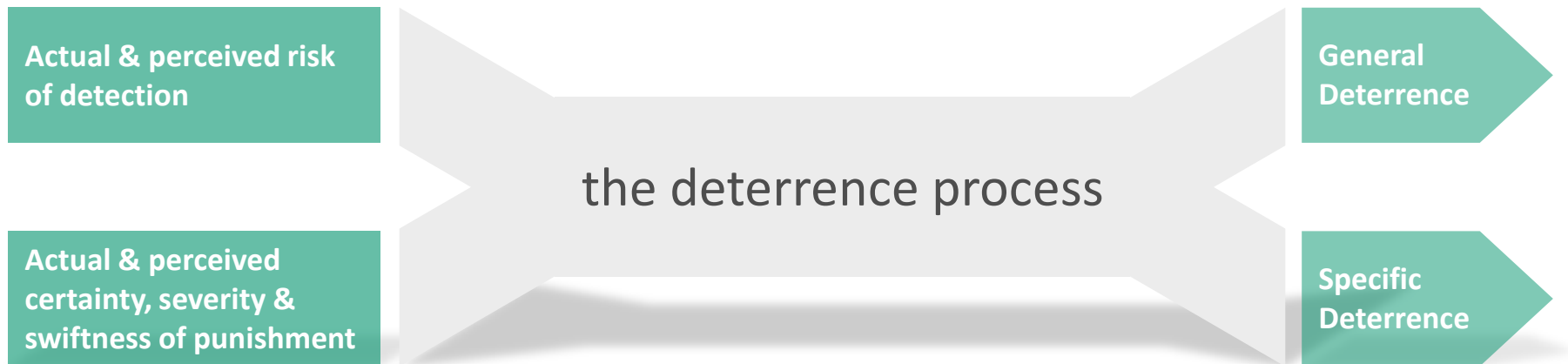
CRASH PHASE		FACTORS		
		HUMAN	VEHICLES & EQUIPMENT	ENVIRONMENT
Pre-Crash	Preventing crashes	<ul style="list-style-type: none"> <li>• Information</li> <li>• Attitudes &amp; behaviors</li> <li>• Police enforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Roadworthiness</li> <li>• Lighting</li> <li>• Braking &amp; handling</li> </ul>	<ul style="list-style-type: none"> <li>• Road design &amp; layout</li> <li>• Speed limits</li> <li>• Pedestrian facilities</li> </ul>
Crash	Preventing injuries during a crash	<ul style="list-style-type: none"> <li>• Use of restraints</li> </ul>	<ul style="list-style-type: none"> <li>• Occupant restraints</li> <li>• Other safety devices</li> <li>• Crash-protective design</li> </ul>	<ul style="list-style-type: none"> <li>• Crash-protective roadside objects</li> </ul>
Post-crash	Sustaining life	<ul style="list-style-type: none"> <li>• First-aid skill</li> <li>• Access to medics</li> </ul>	<ul style="list-style-type: none"> <li>• Ease of access</li> <li>• Fire risk</li> </ul>	<ul style="list-style-type: none"> <li>• Rescue facilities</li> <li>• Congestion</li> </ul>

## The Deterrence Effect

The concept of **deterrence** refers to the enforcement of laws and the threat of legal punishment as a way to discourage people from committing illegal acts. The perceived risk of detection is considered one of the most important factors in determining the effectiveness of law enforcement as a means of deterring illegal road behavior. If people believe there is a low probability that

traffic offenses will be detected and punished, it is unlikely that traffic enforcement will have a significant deterrent effect.

It is generally accepted that traffic enforcement results in two types of deterrence: general deterrence and specific deterrence.



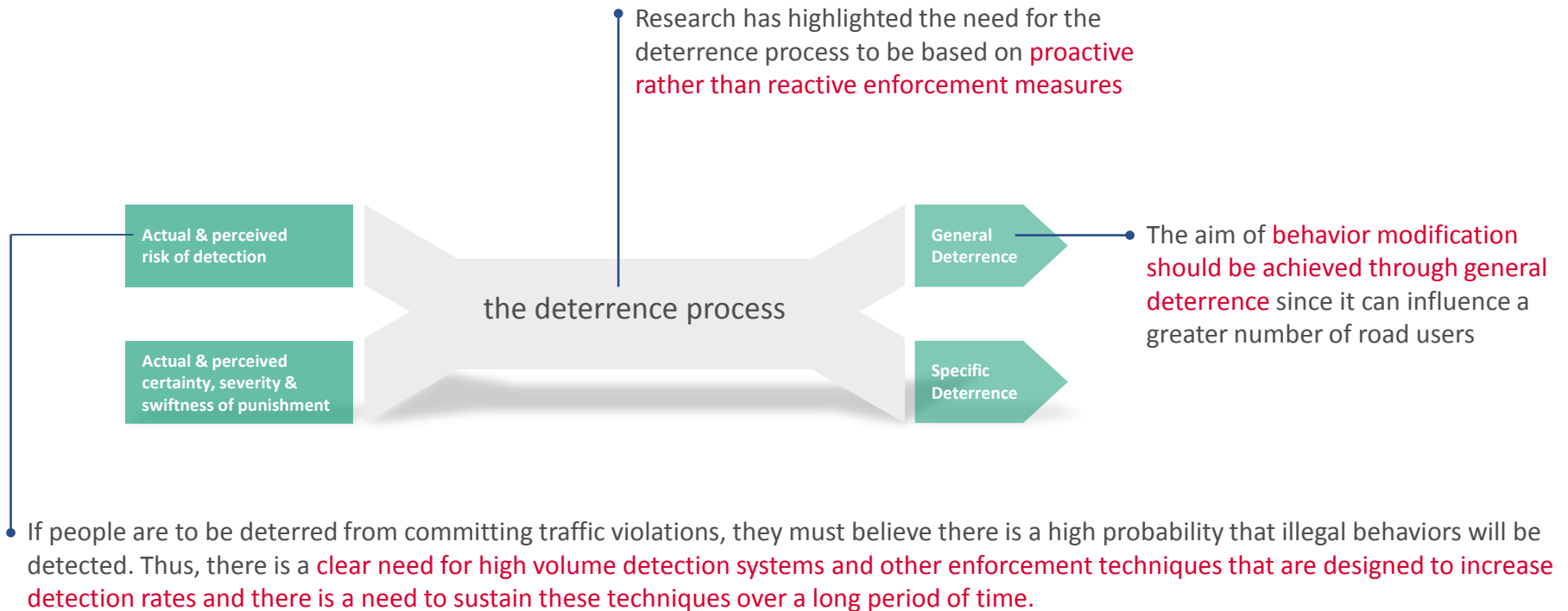
## General Deterrence

- Influences the road behavior of the public at large
- Results from high visibility enforcement activities and a belief that there is a real risk of detection and punishment when traffic laws are broken

## Specific Deterrence

- Influences the road behavior of convicted offenders due to previous detection and punishment

## Research Findings on the Deterrence Effect



**Deterrence theory suggests that traffic enforcement is most effective when the driving public perceives that they are likely to be caught and held accountable. Thus, contemporary interventions to prevent traffic collisions seek to increase the perceived risk of detection of illegal behavior among road users.**



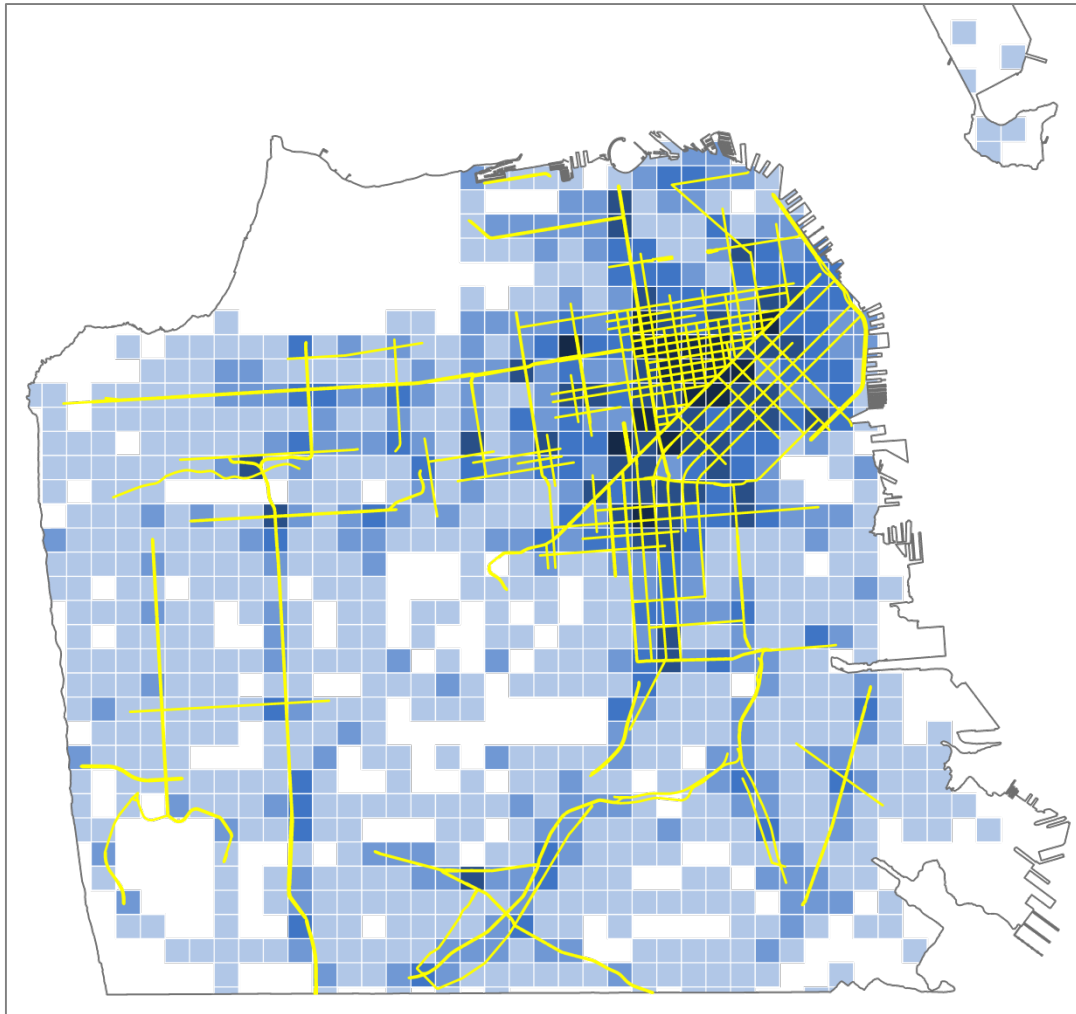
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## Collision Data

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## **Collision Data Pertaining to the Spatial Extent of Enforcement**

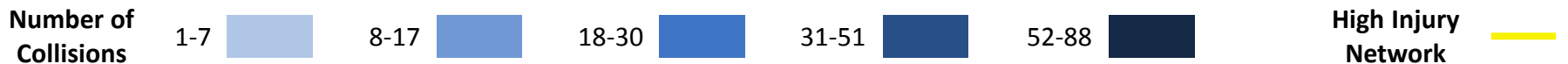
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## Fatal, Severe Injury & Non-severe Injury Collisions (2013-2015)

9,133 fatal, severe injury, and non-severe injury collisions occurred in San Francisco from 2013-2015.

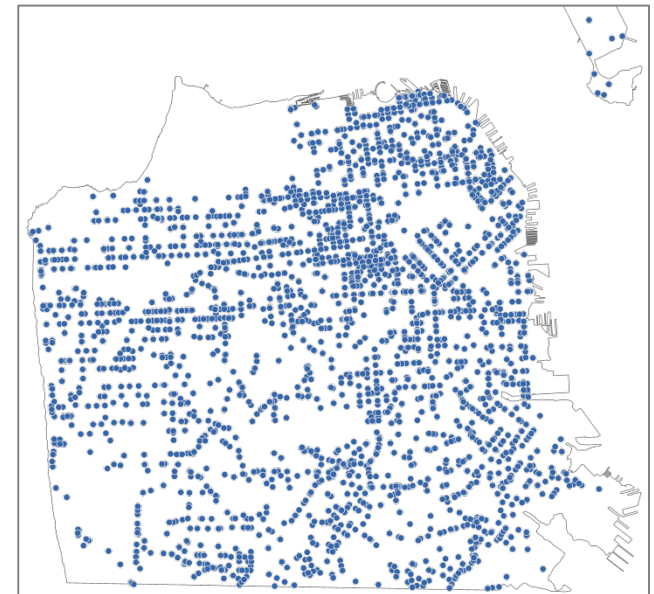
Shown in yellow, the High Injury Network (HIN) was developed using years of data to identify where the most investments in engineering, education and enforcement should be focused to have the biggest impact in reducing fatalities and severe injuries. Accordingly, the SFPD currently focuses its enforcement activities on the locations on the HIN where most collisions occur. While such targeted traffic enforcement at focused locations has been shown to decrease vehicle speeds and the number of speeding vehicles in some situations, the SFPD should be careful not to neglect the majority of the roads that are not part of the HIN and it should avoid concentrating its enforcement operations to such an extent that they become predictable, and thus less effective.



## Distribution of Fatal & Injury Collisions (2013-2015)

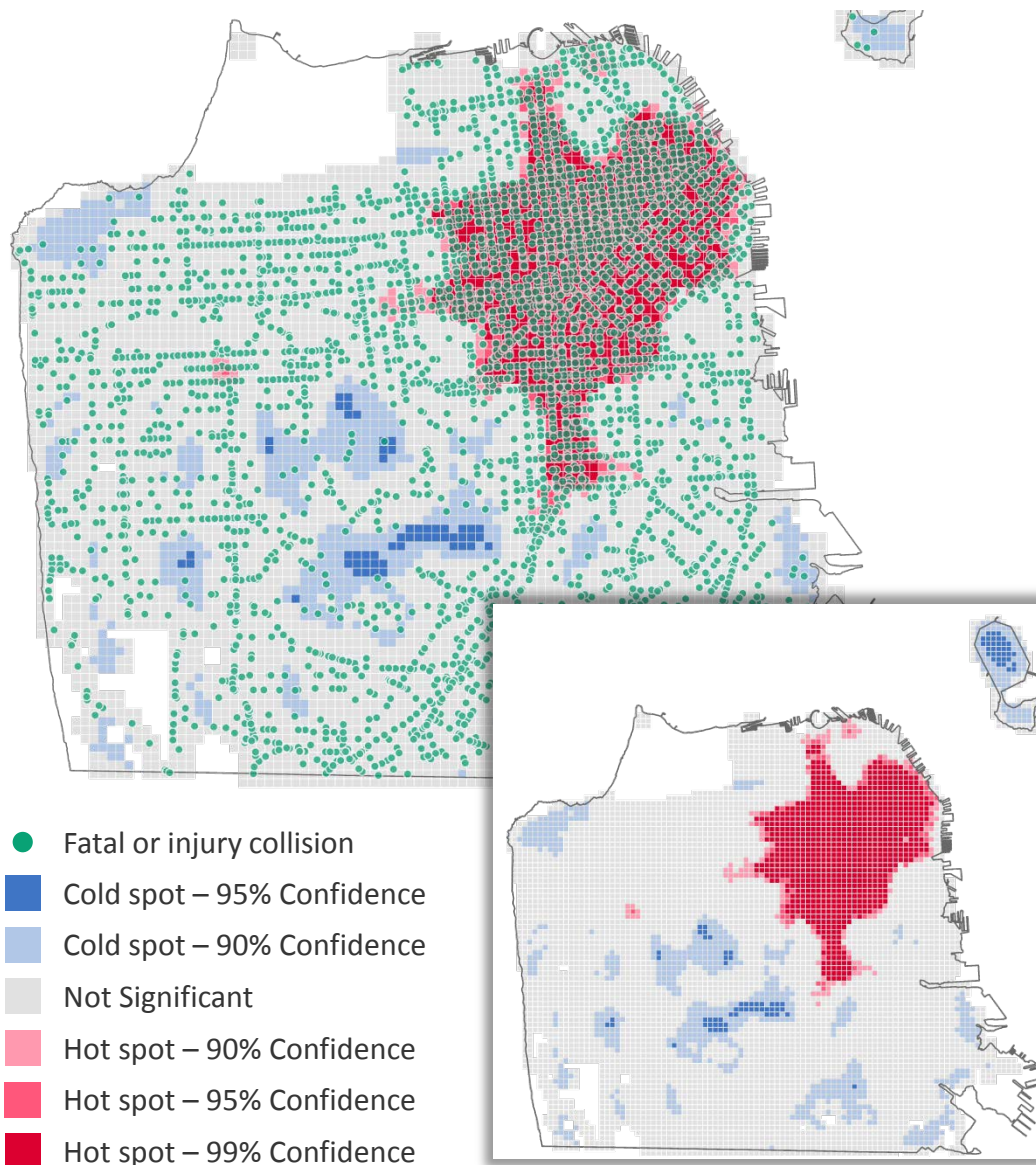
A sizeable fraction of fatal and injury collisions occur outside of the Vision Zero HIN. The City’s goal of eliminating traffic fatalities by 2024 requires enforcement strategies that deter illegal and unsafe driving behaviors not only on the 12% of city streets that make up the HIN but everywhere throughout the City.

Road Segment	Collision Severity			
	<i>Fatal</i>	<i>Severe Injury</i>	<i>Non-severe Injury</i>	<i>All Fatal &amp; Injury</i>
High Injury Network	60% 56	64% 386	61% 5,129	61% 5,571
Non-High Injury Network	<b>39%</b> 37	<b>35%</b> 209	<b>38%</b> 3,247	<b>38%</b> 3,493
Unknown	1% 1	1% 4	1% 64	1% 69
	100% 94	100% 599	100% 8,440	100% 9,133



● Collisions not on the HIN

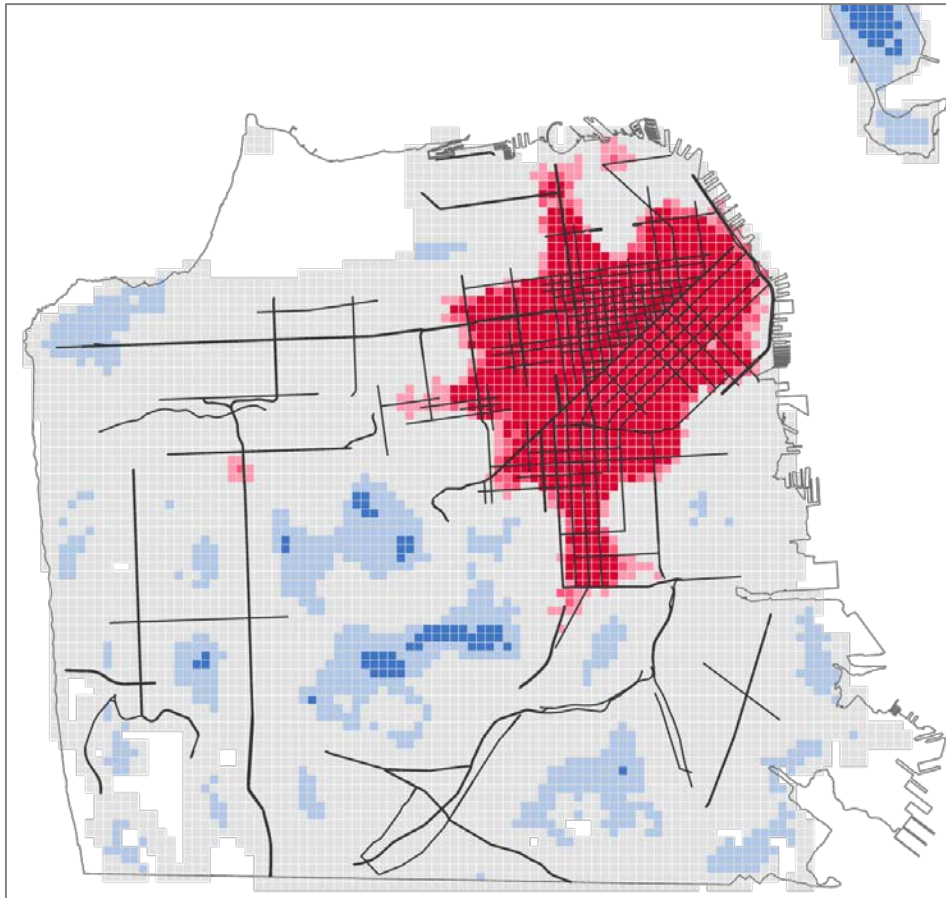




## Hot Spot Analysis (2013-2015)

A hot spot analysis further illustrates the rationale for potentially broadening the scope of enforcement beyond the HIN.

In a hot spot analysis, the city is divided into a grid and statistical tests are used to determine if the number of collisions in each grid cell is higher or lower than would be expected if the collisions were randomly distributed. Areas shaded in red have significantly more collisions than expected and areas shaded in blue have significantly fewer collisions than expected. The confidence level signifies how certain we can be about these estimates. For example a confidence level of 99% means that there is only 1 in 100 chance that the observed number of collisions at a particular location could have occurred randomly. Areas shaded in gray do not have a statistically significant number of collisions (either high or low).



## Hot Spot Results with the High Injury Network (2013-2015)

Based on the 2013-2015 data, our analysis reveals a large hot spot in the upper right quadrant of the city. Note that portions of the HIN lie in areas that, from a statistical standpoint, do not have an unexpectedly high or low number of incidents.<sup>1</sup>

It is also necessary to consider the practical reality that not every site within the road network lends itself to manned enforcement operations. Given this, and the fact that the HIN comprises only 12% of the City's streets, too great a focus on the HIN could lead to operations that are predictable, and thus less effective. This leads us to the following conclusion:

---

### **Recommendation 1**

***The SFPD should seek out opportunities to extend its enforcement presence beyond the HIN so as to create the impression among the driving public that violations of the law, wherever they occur, will be detected. The selection of alternative sites should be data driven and should consider vulnerable populations at sites such as schools and senior centers. The online collision maps we have developed as a companion to this report can be used for such a purpose.***

---

**Notes:** 1. While portions of the HIN are not within the statistically significant hot spots shown here, much of the HIN is within the large hot spot in the northeast quadrant of the City. Furthermore, it is also important to keep in mind that the HIN was developed using a different methodology that considered corridor level patterns.

## Research Findings

Our recommendation that the SFPD seek to broaden the spatial scope of its enforcement activities is supported by a wide body of research in the field of traffic policing and crash prevention:

***Traffic Law Enforcement: A Review of the Literature***  
Zaal, 1994, p. ix

“Traditional vehicle based enforcement methods should focus on increasing the visibility and **unpredictability** of traffic policing operations.” [emphasis added]

***The Effectiveness of Traffic Policing in Reducing Traffic Crashes***  
Bates, Soole & Watson, 2012, p. 99

“While it has typically been argued that operations should predominantly target peak times and locations, the importance of random operations at non-peak times and locations has also been identified as essential to facilitating the unpredictability of enforcement efforts. **The development of effective programmes can also be optimized by adopting intelligence-led enforcement strategies, although this should not result in enforcement operations that are predictable.**” [emphasis added]

***Methodological Approach to Spatiotemporal Optimization of Rural Freeway Enforcement in Florida***  
Carrick, Bejleri & Ouyang, 2014, p. 8

“**A problem-oriented approach would identify times and locations where the number or rate of crashes was highest and then apply traffic enforcement to that location**, much like hot spot identification. There is a role for such special enforcement efforts, **but to dedicate all resources in that way would neglect the realities of patrol allocation...and the value of general deterrence.**” [emphasis added]

## Research Findings

Additional conclusions from the Transportation Research Board (TRB) of the National Academy of Sciences:

### ***A Guide for Addressing Unsignalized Intersection Collisions***

TRB 2003, p. V-95

“The major potential difficulty with a program [involving targeted enforcement to reduce stop sign violations] is the **potential for diverting police officers from more productive work if the locations for stop sign enforcement are not selected carefully.**” [emphasis added]

### ***A Guide for Reducing Speeding-Related Crashes***

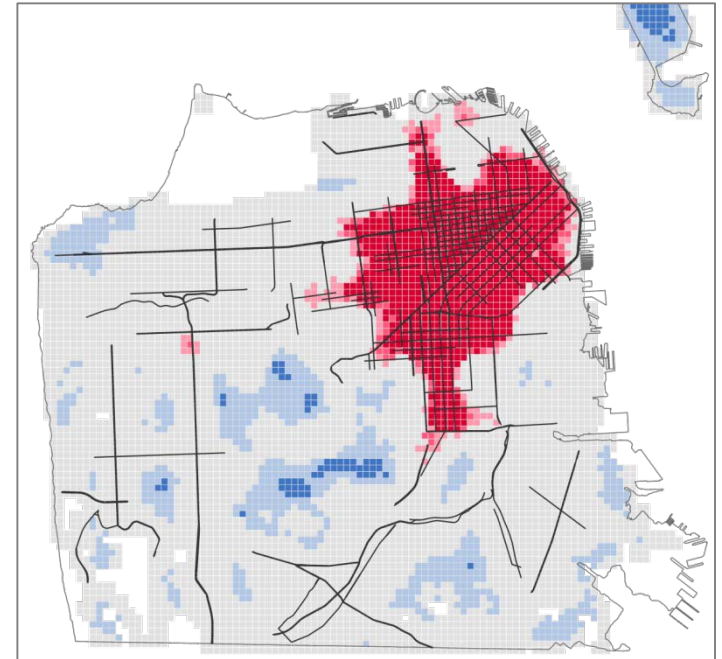
TRB 2009, p. V-30

“...the **deterrent effect of law enforcement presence is often location specific for most drivers on urban roads** (less than 40 mph), in that they decrease travel speeds at locations where they know or think law enforcement might be present (based on previous experiences), but speed up after the enforcement zone. This can have a negative impact, as drivers may choose to travel different routes where law enforcement presence is less common. **This emphasizes the importance of reevaluating the areas in need of law enforcement on a regular basis. As drivers choose different routes, based on law enforcement presence, speeding may become an issue at other locations. This should be monitored and adjustments in enforcement made as needed.** This also indicates a need for a greater number of law enforcement, if an area-wide problem exists.” [emphasis added]

## A Note about the High Injury Network

Although we recommended earlier that the SFPD seek out opportunities to expand its enforcement presence beyond the HIN where it is reasonable to do so, we wish to emphasize the important role that the HIN has played over the last several years and should continue to play with respect to traffic enforcement and the other components of the Vision Zero strategy.

As previously mentioned, the HIN was developed by the San Francisco Department of Public Health in collaboration with the SFMTA based on several years of data in order to identify corridors with high concentrations of injuries to road users of all types.<sup>1</sup> The resulting network is particularly useful in identifying specific locations in the road network that can benefit from safety improvements, in ascertaining the nature of the necessary improvements, and in prioritizing the work to be done. However, the road improvements that we implement to prevent traffic collisions must by their very nature be installed at fixed locations. In contrast, enforcement-related safety measures seek to deter dangerous, and often deadly, behaviors that can occur virtually anywhere road users may travel.



From an enforcement perspective, the data presented in this section show that to a certain extent, traffic collisions represent an area-wide problem, which demands an area-wide solution. That said, many parts of the HIN include corridors where high volumes of drivers, bicyclists, and pedestrians come together in close proximity and our point is not to dissuade the SFPD from deploying its resources there. Rather, our intent simply is to encourage the SFPD to think creatively about how it can vary its operations so as to maximize the general deterrent effect of enforcement on the HIN and everywhere else.

Notes: 1. The HIN was initially developed with data through 2012 and it is currently being updated with data through 2015.

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**Collision Data Pertaining  
to Dangerous Road  
User Behaviors**

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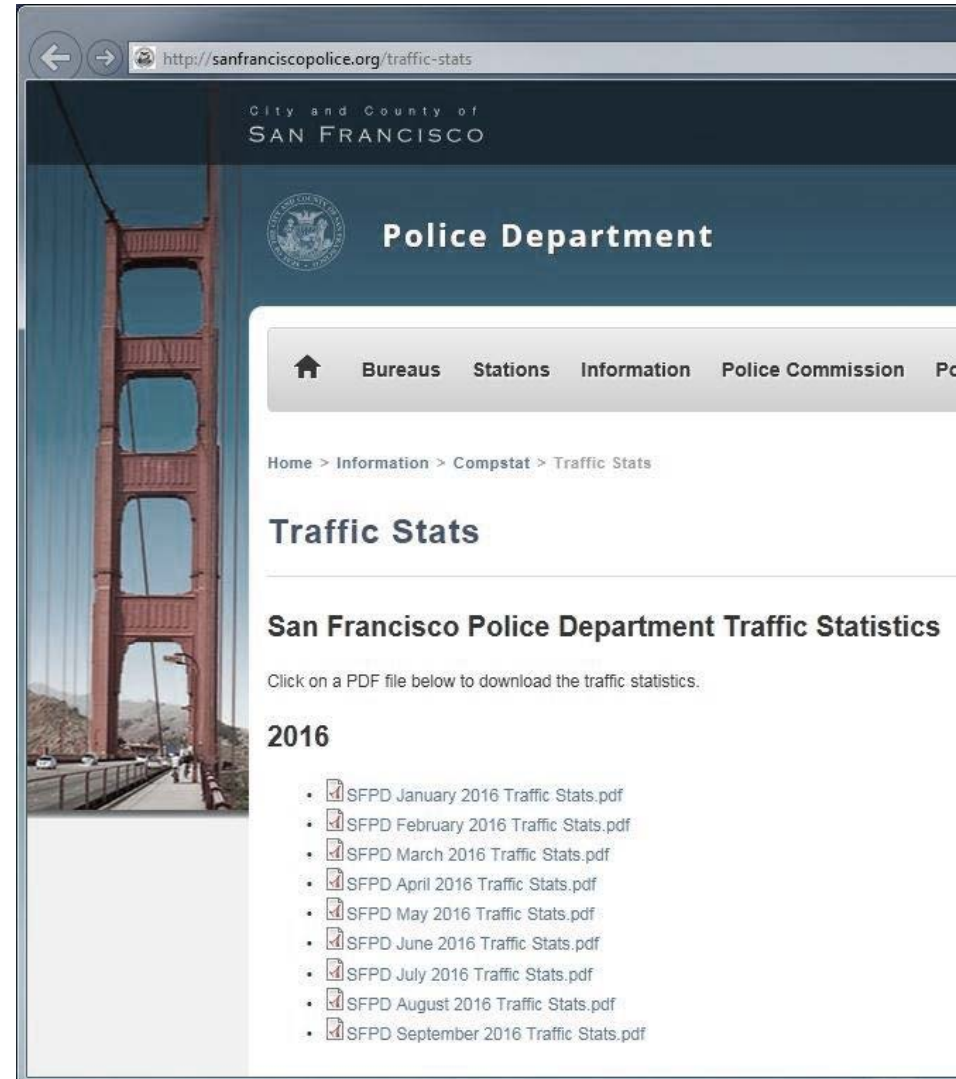
## Adoption of Focus on the Five

In 2012, the SFMTA analyzed collision data over a five year period and found that the top five causes of collisions in the City were:

- Driving at an unsafe speed for the conditions of the roadway,
- Vehicular failure to stop at a limit line, crosswalk, or intersection at a red light,
- Failure to yield to pedestrians at a crosswalk,
- Failure to yield while making a left or U-turn, and
- Failure to stop before the limit line, crosswalk, or intersection at a STOP sign.

Based on this analysis, the SFPD adopted a strategy known as Focus on the Five, which established a goal that half of its citations be for one of these five violations.

The SFPD publishes monthly traffic statistics on its website at <http://sanfranciscopolice.org/traffic-stats>.



The screenshot shows a web browser window displaying the San Francisco Police Department's Traffic Stats page. The browser's address bar shows the URL <http://sanfranciscopolice.org/traffic-stats>. The page features a header with the City and County of San Francisco logo and the Police Department name. A navigation menu includes links for Bureaus, Stations, Information, Police Commission, and other sections. The main content area is titled "Traffic Stats" and "San Francisco Police Department Traffic Statistics". It includes a breadcrumb trail: Home > Information > Compstat > Traffic Stats. Below this, there is a section for "2016" with a list of PDF links for each month from January to September.

City and County of  
SAN FRANCISCO

Police Department

Home > Information > Compstat > Traffic Stats

### Traffic Stats

#### San Francisco Police Department Traffic Statistics

Click on a PDF file below to download the traffic statistics.

#### 2016

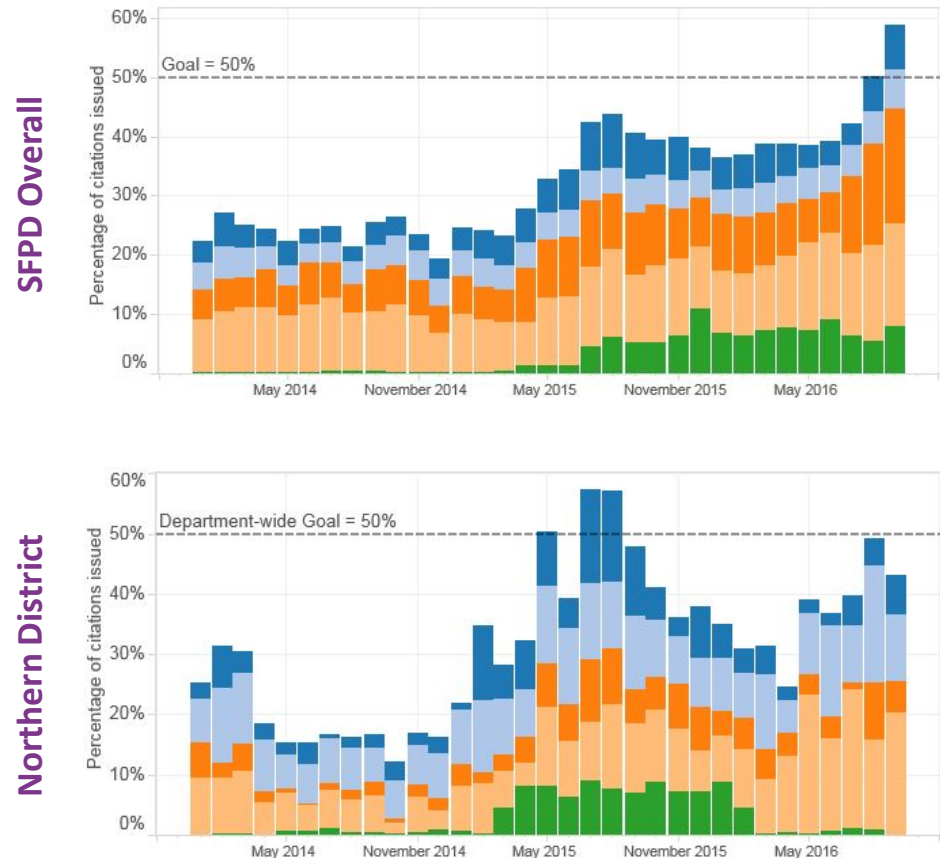
- [SFPD January 2016 Traffic Stats.pdf](#)
- [SFPD February 2016 Traffic Stats.pdf](#)
- [SFPD March 2016 Traffic Stats.pdf](#)
- [SFPD April 2016 Traffic Stats.pdf](#)
- [SFPD May 2016 Traffic Stats.pdf](#)
- [SFPD June 2016 Traffic Stats.pdf](#)
- [SFPD July 2016 Traffic Stats.pdf](#)
- [SFPD August 2016 Traffic Stats.pdf](#)
- [SFPD September 2016 Traffic Stats.pdf](#)

## Benefits and Limitations of the Focus on the Five Strategy

Data gathered over the course of our analysis suggest that the Focus on the Five campaign has played an important role in encouraging the SFPD to direct more of its traffic enforcement resources toward road user behaviors that result in severe injury or death. This focus has no doubt improved the safety of our streets. At the same time, however, [performance data](#) published on a monthly basis by the Controller’s Office reveals that while a few individual police districts have had success in attaining this goal, other districts and the SFPD as a whole have struggled to meet it.

The SFPD’s general inability to meet this goal is not for a lack of effort – the department has maintained a firm commitment to Focus on the Five for the last several years and the number of traffic citations it has issued has remained relatively steady in the last couple of years (129,597 citations were issued in 2014 and 120,133 were issued in 2015). Rather, it is possible that the difficulty the SFPD has had meeting this goal is due to limitations that are inherent to the goal itself. Most notably, the multitude of factors that contribute to collisions (e.g., road characteristics and conditions, traffic controls, traffic speeds, traffic and pedestrian volumes, and a variety of human-related factors) are not necessarily the same from one police district to another. The Tenderloin police district serves as a simple example of these differences. With a single STOP sign in the entire district, officers who work in the Tenderloin are unlikely to issue a large number of citations for that Focus on the Five component.

Percentage of “Focus on the Five” Citations<sup>1</sup>



- Notes:**
1. Effective September 2016, the percentage of citations for the top five causes of collisions is calculated as a percentage of traffic citations. Before September 2016, this calculation was as a percentage of all citations.



### Sharpening the Focus on the Five

In the book *Policing and Security in Practice: Challenges and Achievements* (2012), experts in the field of policing and traffic collisions stress two important points related to the nature of traffic enforcement:

“...there is increasing awareness that **paying attention to causes lends credence to the need for a varied response to crime so that actions taken are fit for their purpose and are more likely to have an effect.**” [emphasis added]

“...**enforcement operations need to be tailored to the specific driving context and driving environment, such that a ‘one-size-fits-all’ approach is unlikely to be effective.**” [emphasis added]

In its current form, the Focus on the Five strategy largely is a one-size-fits-all approach that unnecessarily constrains officers to focusing on a limited set of driving behaviors, which do not necessarily correspond to the main causes of collisions in their own districts. Based on the insights above and other findings in the body of research on effective policing, we recommend that the SFPD modify its Focus on the Five strategy so that it is better suited to the unique environment of each police district and allows for an appropriately varied response to the problem of traffic collisions.

---

#### **Recommendation 2**

***The SFPD should modify its Focus on the Five strategy so that it is better suited to the unique environment of each police district and allows for an appropriately varied response to the problem of traffic collisions.***

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## Methodology for Identifying Priority Behaviors in each District

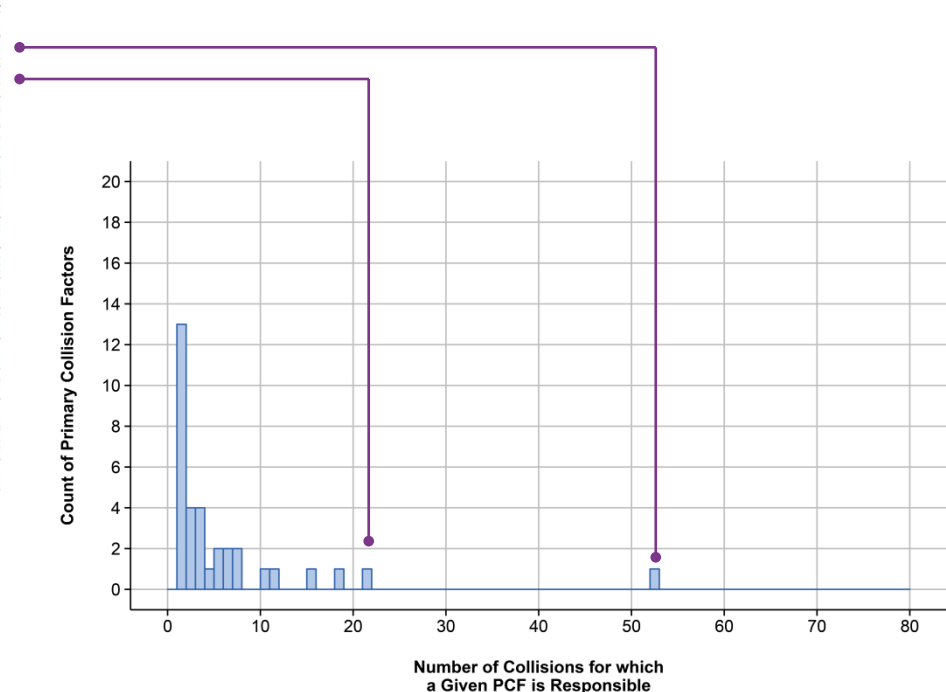
- Count the number of fatal and injury collisions (excluding collisions involving only a complaint of pain) for which each primary collision factor (PCF) is responsible and rank order them

*Example: Bayview Police District*

Tabular Format

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	52
22107	Unsafe turn or lane change prohibited	21
21950(a,c)	Driver to yield right-of-way at crosswalks	18
23152	Driving under the influence of alcohol or drug	15
21453(a,c)	"Red" signal - vehicular responsibilities	12
22450(a)	Failure to stop at STOP sign	10
21801(a,b)	Violation of right-of-way - left turn	7
21955	Crossing between controlled intersections (Jaywalking)	7
21658(a,b)	Lane straddling/failure to use specified lanes	6
21802(a,b)	Violation of right-of-way - entering through highway	6
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22106	Unsafe starting or backing on highway	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21650	Failure to keep to right side of road	3

Graphical Format



## Methodology for Identifying Priority Behaviors in each District

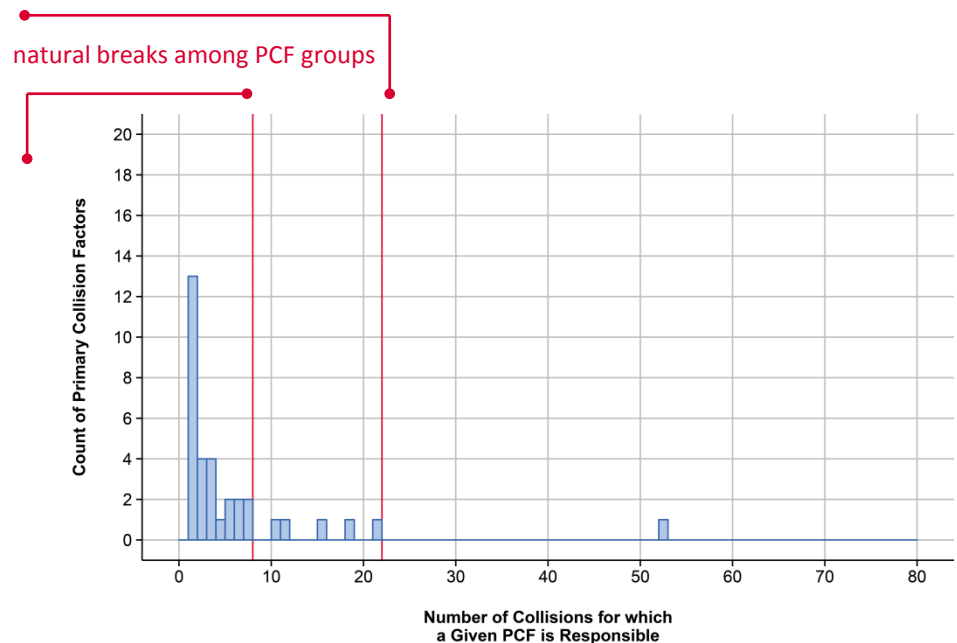
- Perform a data clustering analysis to determine the best arrangement of these values into three different groups (high, medium, low prevalence) using a method known as “Jenks natural breaks optimization”

*Example: Bayview Police District*

Tabular Format

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	52
22107	Unsafe turn or lane change prohibited	21
21950(a,c)	Driver to yield right-of-way at crosswalks	18
23152	Driving under the influence of alcohol or drug	15
21453(a,c)	"Red" signal - vehicular responsibilities	12
22450(a)	Failure to stop at STOP sign	10
21801(a,b)	Violation of right-of-way - left turn	7
21955	Crossing between controlled intersections (Jaywalking)	7
21658(a,b)	Lane straddling/failure to use specified lanes	6
21802(a,b)	Violation of right-of-way - entering through highway	6
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22106	Unsafe starting or backing on highway	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21650	Failure to keep to right side of road	3

Graphical Format



## Methodology for Identifying Priority Behaviors in each District

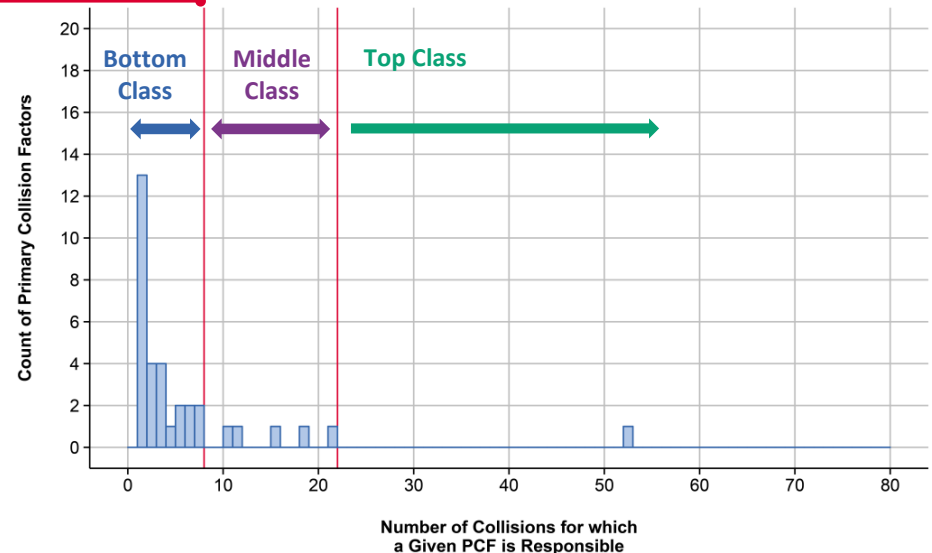
After counting the number of collisions for which each collision factor is responsible (step 1 of our analysis), the question still remains as to where the SFPD should focus its efforts. For example, should the SFPD focus on the top factor alone or should it focus on additional factors in the list? Also, if the SFPD should focus on more than just the top factor, how far down the list should it go?

The purpose of the Jenks natural breaks optimization (step 2 of the analysis) is to divide the data into three groups or “classes” such that each class contains data points with similar values. In the case of the Bayview District (shown below), the top class is

comprised of one primary collision factor (listed in the table as “Unsafe speed for prevailing conditions”), while the middle class is comprised of five other primary collision factors. The resulting classes from this analysis are indicative of the relative significance of the various factors in each district. In this case, we are recommending that the SFPD focus on the primary collision factors that fall in the top two classes in each district in order to maximize the safety benefits of its traffic enforcement efforts. Pages 33 through 43 contain charts that show the percentage of collisions comprised by the top two classes in each police district.

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	52
22107	Unsafe turn or lane change prohibited	21
21950(a,c)	Driver to yield right-of-way at crosswalks	18
23152	Driving under the influence of alcohol or drug	15
21453(a,c)	"Red" signal - vehicular responsibilities	12
22450(a)	Failure to stop at STOP sign	10
21801(a,b)	Violation of right-of-way - left turn	7
21955	Crossing between controlled intersections (Jaywalking)	7
21658(a,b)	Lane straddling/failure to use specified lanes	6
21802(a,b)	Violation of right-of-way - entering through highway	6
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22106	Unsafe starting or backing on highway	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21650	Failure to keep to right side of road	3

natural breaks among PCF groups



## Results of PCF Clustering Analysis (2013-2015; fatal and injury collisions excluding those with only a complaint of pain)

The table below summarizes the results of our district-level PCF analysis.<sup>1</sup> The cells shaded in blue represent the primary collision factors that emerged from the clustering analysis in the top two classes for each district.<sup>2</sup> Compared to the current Focus on the

Five strategy, the potential number of priority primary collision factors has expanded in all districts. Some districts, like the Central and Tenderloin have as many as twelve priority PCFs.

PCF	Description	District <sup>1</sup>										Count
		Bayview	Central	Ingleside	Mission	Northern	Park	Richmond	Southern	Taraval	Tenderloin	
22350	Unsafe speed for prevailing conditions	x	x	x	x	x	x	x	x	x	x	10
21950(a,c)	Driver to yield right-of-way at crosswalks	x	x	x	x	x	x	x	x	x	x	10
21453(a,c)	"Red" signal - vehicular responsibilities	x	x	x	x	x	x	x	x	x	x	10
22107	Unsafe turn or lane change prohibited	x	x	x	x	x	x	x	x	x	x	10
23152	Driving under the influence of alcohol or drug	x	x	x	x	x		x	x	x		8
21801(a,b)	Violation of right-of-way - left turn		x	x	x	x		x	x	x		7
22517	Opening door on traffic side when unsafe		x		x	x		x	x		x	6
21658(a,b)	Lane straddling/failure to use specified lanes		x				x	x	x	x	x	6
21955	Crossing between controlled intersections (Jaywalking)		x		x		x		x		x	5
21954(a)	Pedestrians must yield right-of-way outside of crosswalks		x		x				x	x	x	5
22450(a)	Failure to stop at STOP sign	x		x		x				x		4
22106	Unsafe starting or backing on highway		x				x				x	3
21703	Following too closely prohibited						x			x		2
21802(a,b)	Violation of right-of-way - entering through highway							x		x		2
21453(d)	"Red" signal - pedestrian responsibilities					x					x	2
21950(b)	Pedestrian right-of-way at crosswalks regulated		x								x	2
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals										x	1
22101(d)	Violating special traffic control markers								x			1
	<b>Count</b>	<b>6</b>	<b>12</b>	<b>7</b>	<b>9</b>	<b>9</b>	<b>8</b>	<b>9</b>	<b>11</b>	<b>11</b>	<b>12</b>	

**Notes:** 1. San Francisco is comprised of ten police districts. See Appendix A for a map of the SFPD district boundaries.  
 2. See Appendix D for district-level data regarding the number of collisions associated with each of these factors.

### Aligning the Results of the PCF Clustering Analysis with Vision Zero Principles and the Effective Use of Traffic Enforcement Resources

Vision Zero SF represents a commitment by the City and our community partners to end traffic fatalities and ensure the safety of all road users regardless of characteristics such as income level, race, ethnicity, age, gender, or ability. Inherent in our promise to protect the right that every individual has to move safely through the City is a closely held value of *social equity* – a term that, in its broadest sense, “denotes the spirit and the habit of fairness, justness, and right dealing” with others. A separate but related concept is that of procedural justice, which suggests that how people regard the justice system depends more on the perceived fairness of the *process* rather than to the perceived fairness of the actual *outcome*. Therefore as we proceed in our current efforts to achieve the Vision Zero goal and as we devise new strategies in pursuit of it, we should consider whether these efforts promote a procedurally just system and we ought to ask ourselves a question that David Hart (then a professor of business ethics at the University of Washington) posed more than 40 years ago: “Does this service enhance social equity?”

Nowhere is this question more relevant today than in the field of law enforcement. At first glance the analysis of primary collision factors presented on the preceding page may seem at odds with it – specifically, the results of our clustering analysis include pedestrian violations in seven out of the ten police districts including the Central, Mission, and Tenderloin districts, which have higher concentrations of disadvantaged populations than other areas of the City. At a national level, our jails already have a higher percentage of racial minorities and low-income, homeless, and mentally ill people than are found in the general community and in

no way are we suggesting that the SFPD should take actions that would further criminalize these populations. To do so would undoubtedly cause more harm than good and it certainly would not enhance social equity or help achieve Vision Zero.

As explained in a 2016 study by Fleisher, Wier, and Hunter, Vision Zero is a road safety policy that seeks to eliminate fatalities and serious injuries for all modes of transportation. This policy approach is based on the fundamental premise that we cannot prevent all collisions from occurring, but we can reduce the risk of chronic health impairment or death by addressing three key elements of the road system – roads and roadsides, vehicles, and speed. Fleisher, Wier, and Hunter go on to explain that Vision Zero is also notable in part for its perspective on the issue of responsibility for road safety. Whereas the responsibility for road safety has traditionally been placed on individual road users, Vision Zero emphasizes the role that engineers, public health officials, and other system designers have in implementing countermeasures to ensure that the road network is inherently safer. With this perspective in mind and in light of the aforementioned considerations around equity and procedural justice, the ongoing efforts of the SFPD to build greater trust with the community, and the research presented earlier on general deterrence, we believe it would be inappropriate to incorporate pedestrian related offenses of the Vehicle Code into an enforcement related goal. Instead, we encourage the City and the Vision Zero community to pursue other education, engineering and policy interventions that can more effectively address these issues.

### Further Expansion of the Priority Behaviors Beyond the Clustering Analysis

The data clustering analysis presented earlier identifies the most pertinent collision factors in each district based on the last three years of available data. Although we just explained why the pedestrian related factors should not be incorporated into an enforcement related goal, there are other reasons that the list of behaviors on which the SFPD focuses should be expanded beyond what emerged from our analysis. For example, driving under the influence of alcohol or drugs (CVC § 23152) appears in the top two groups of primary collision factors in eight out of the ten police districts but this is a behavior which the SFPD ought to deter everywhere. Furthermore, texting while driving (CVC § 23123.5(a)) and talking on the phone with a non-hands free device (CVC § 23123(a)) are technically not considered to be

primary collision factors for statewide collision investigation and reporting purposes so these behaviors do not appear in the collision data but we nevertheless know that they contribute to collisions. According to data from the National Highway Traffic Safety Administration, for example, ten percent of fatal crashes and eighteen percent of injury crashes in 2014 were reported as distraction affected crashes. As the result, the SFPD should unquestionably continue its efforts to curb these dangerous behaviors.

The table on the following page reflects a revised set of district-specific factors based on these considerations and the discussion on page 30.

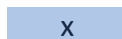
## Recommended Collision Factors and Vehicle Code Violations for Focused Enforcement

Based on the foregoing analysis and considerations, we recommend that the SFPD focus its enforcement efforts on the following factors in each respective district. The pie charts in the pages that follow show that by focusing on this relatively small

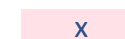
set of factors, the SFPD can address the underlying cause of a significant portion of the collisions that have occurred in the three-year period under study.

PCF	Description	District <sup>1</sup>									
		Bayview	Central	Ingleside	Mission	Northern	Park	Richmond	Southern	Taraval	Tenderloin
● 22350	Unsafe speed for prevailing conditions	x	x	x	x	x	x	x	x	x	x
● 21950(a,c)	Driver to yield right-of-way at crosswalks	x	x	x	x	x	x	x	x	x	x
● 21453(a,c)	"Red" signal - vehicular responsibilities	x	x	x	x	x	x	x	x	x	x
22107	Unsafe turn or lane change prohibited	x	x	x	x	x	x	x	x	x	x
23152	Driving under the influence of alcohol or drug	x	x	x	x	x	x	x	x	x	x
● 21801(a,b)	Violation of right-of-way - left turn		x	x	x	x		x	x	x	
22517	Opening door on traffic side when unsafe		x		x	x		x	x		x
21658(a,b)	Lane straddling/failure to use specified lanes		x				x	x	x	x	x
● 22450(a)	Failure to stop at STOP sign	x		x		x				x	
22106	Unsafe starting or backing on highway		x				x				x
21703	Following too closely prohibited						x			x	
21802(a,b)	Violation of right-of-way - entering through highway							x		x	
22101(d)	Violating special traffic control markers								x		
23123(a)	Driving while using a wireless telephone not configured for hands-free use	x	x	x	x	x	x	x	x	x	x
23123.5(a)	Driving while using a wireless device to send, read, or write text communication unless the device is used in a hands-free and voice-operated manner	x	x	x	x	x	x	x	x	x	x
	<b>Count</b>	<b>8</b>	<b>11</b>	<b>9</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>12</b>	<b>10</b>

● Current Focus on the Five Factors



Factors resulting from the clustering analysis<sup>2</sup>



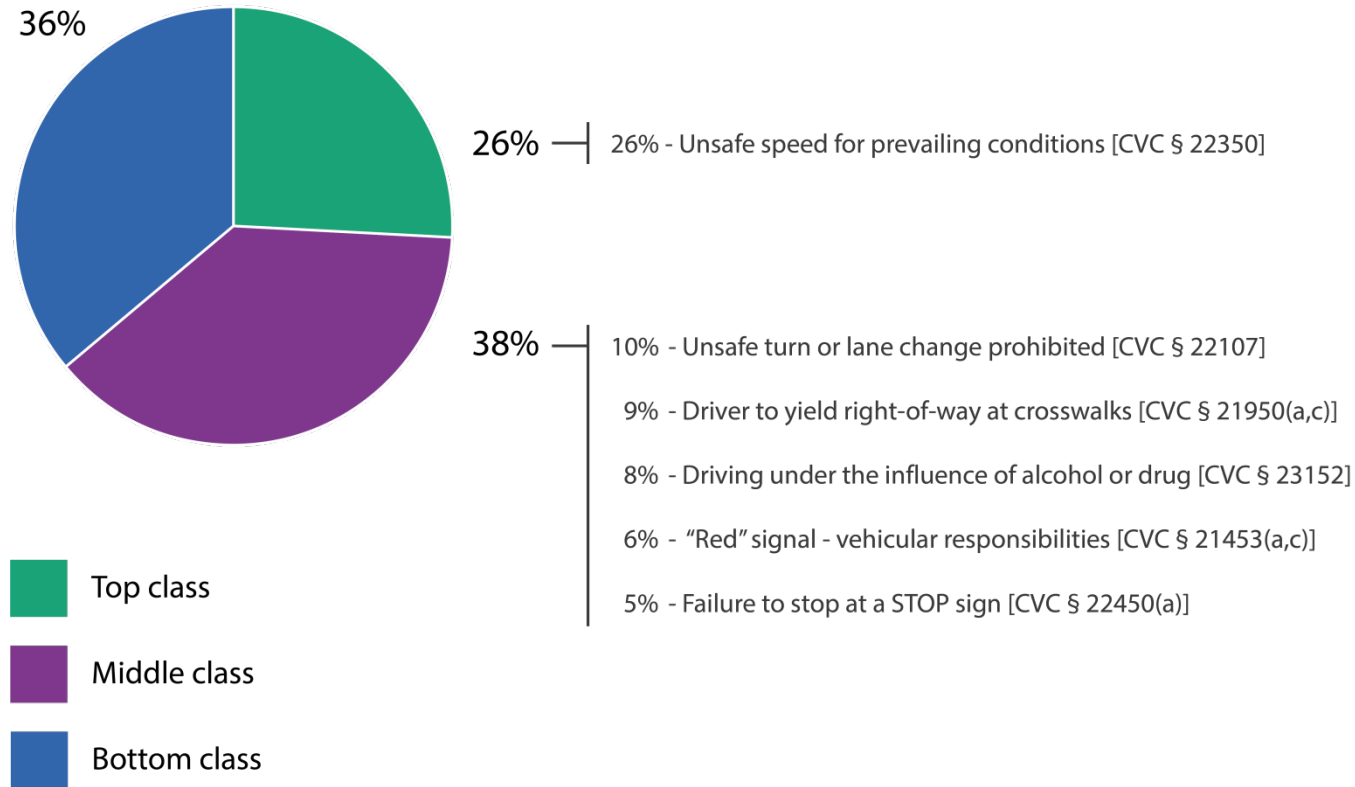
Expanded factors

**Notes:** 1. San Francisco is comprised of ten police districts. See Appendix A for a map of the SFPD district boundaries.  
 2. See Appendix D for district-level data regarding the number of collisions associated with each of these factors.

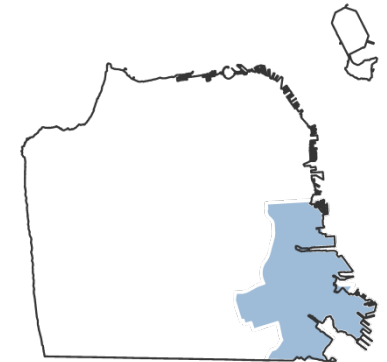


## Distribution of the Primary Collision Factors in the Bayview District

The top two classes of collision factors<sup>1</sup> account for 64% of collisions with known primary factors<sup>2,3</sup>

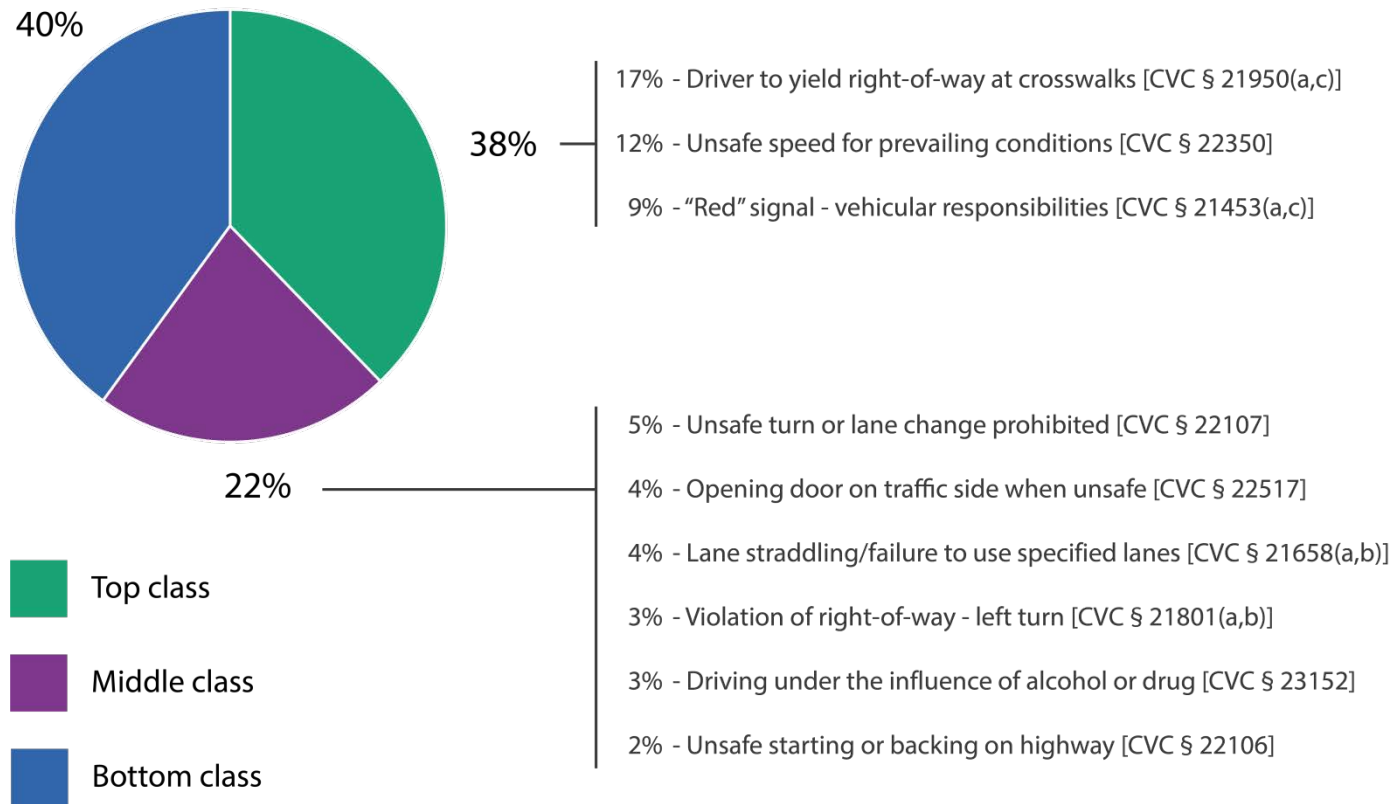


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

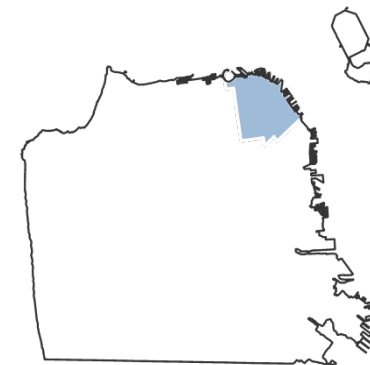


## Distribution of the Primary Collision Factors in the Central District

The top two classes of collision factors<sup>1</sup> account for 60% of collisions with known primary factors<sup>2,3</sup>

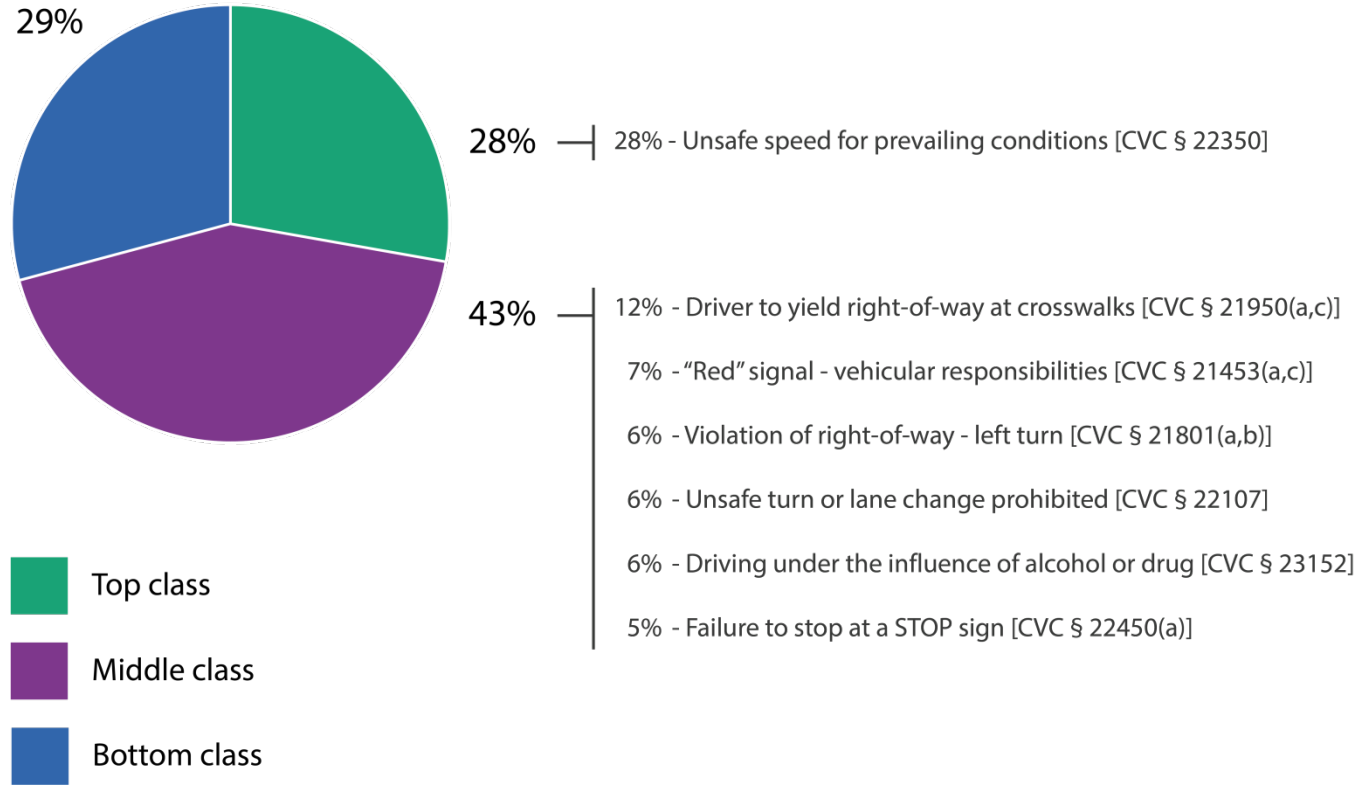


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

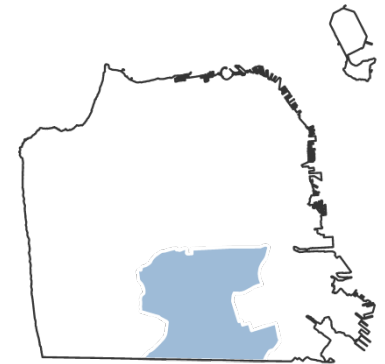


## Distribution of the Primary Collision Factors in the Ingleside District

The top two classes of collision factors<sup>1</sup> account for 71% of collisions with known primary factors<sup>2,3</sup>

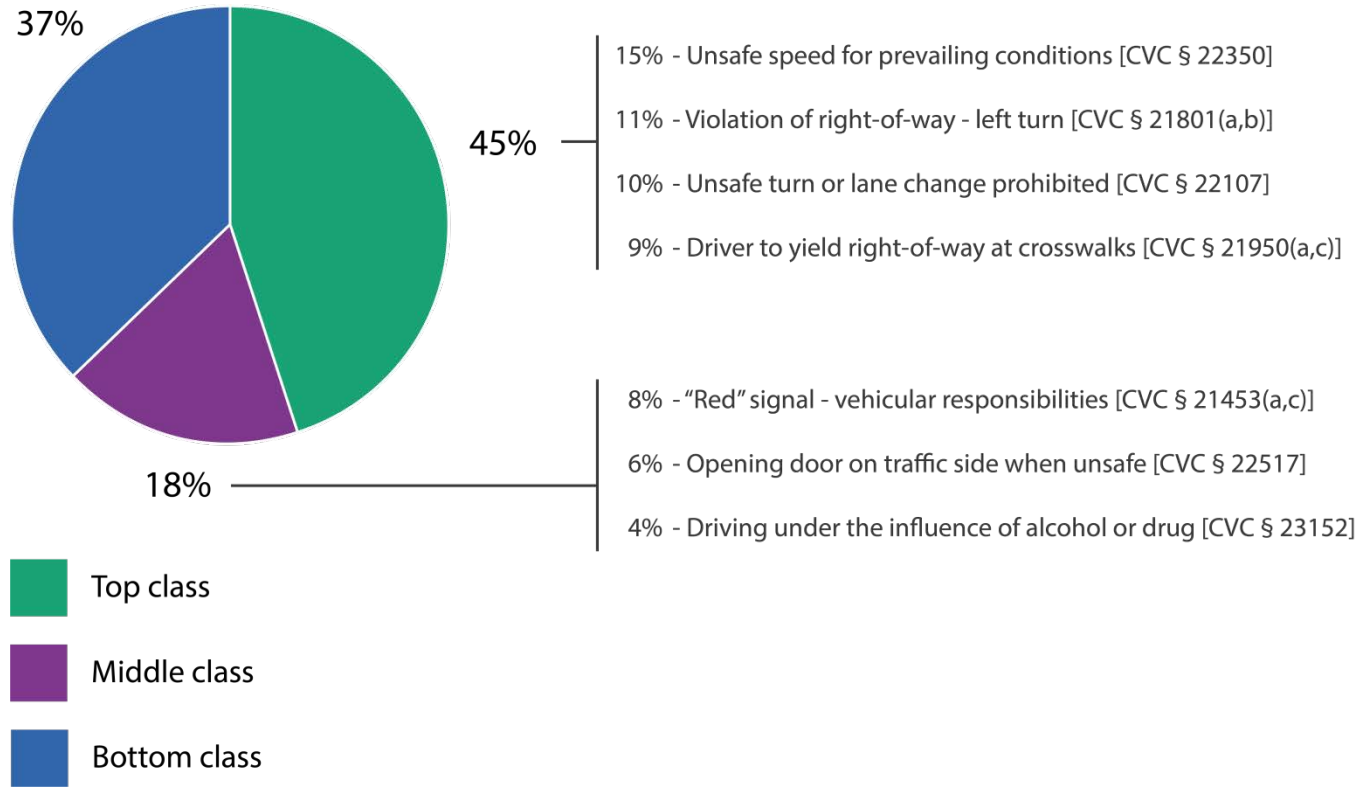


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

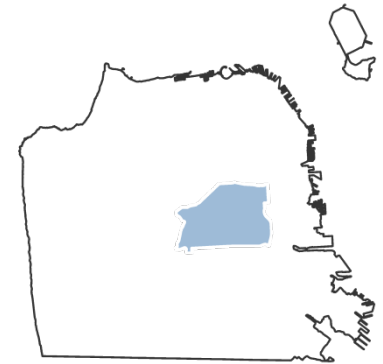


## Distribution of the Primary Collision Factors in the Mission District

The top two classes of collision factors<sup>1</sup> account for 63% of collisions with known primary factors<sup>2,3</sup>

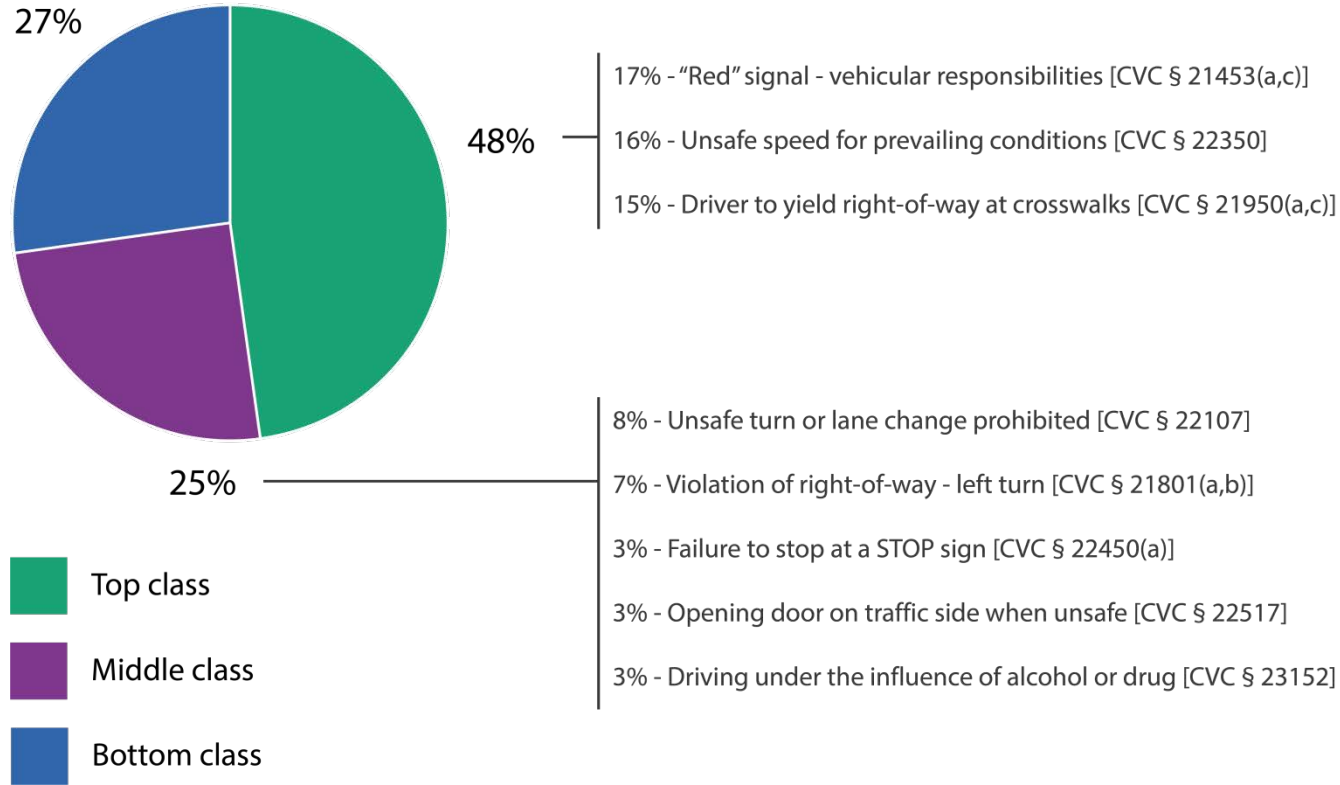


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

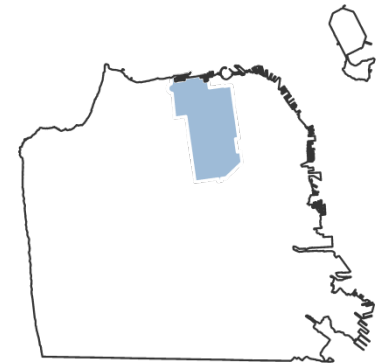


## Distribution of the Primary Collision Factors in the Northern District

The top two classes of collision factors<sup>1</sup> account for 73% of collisions with known primary factors<sup>2,3</sup>

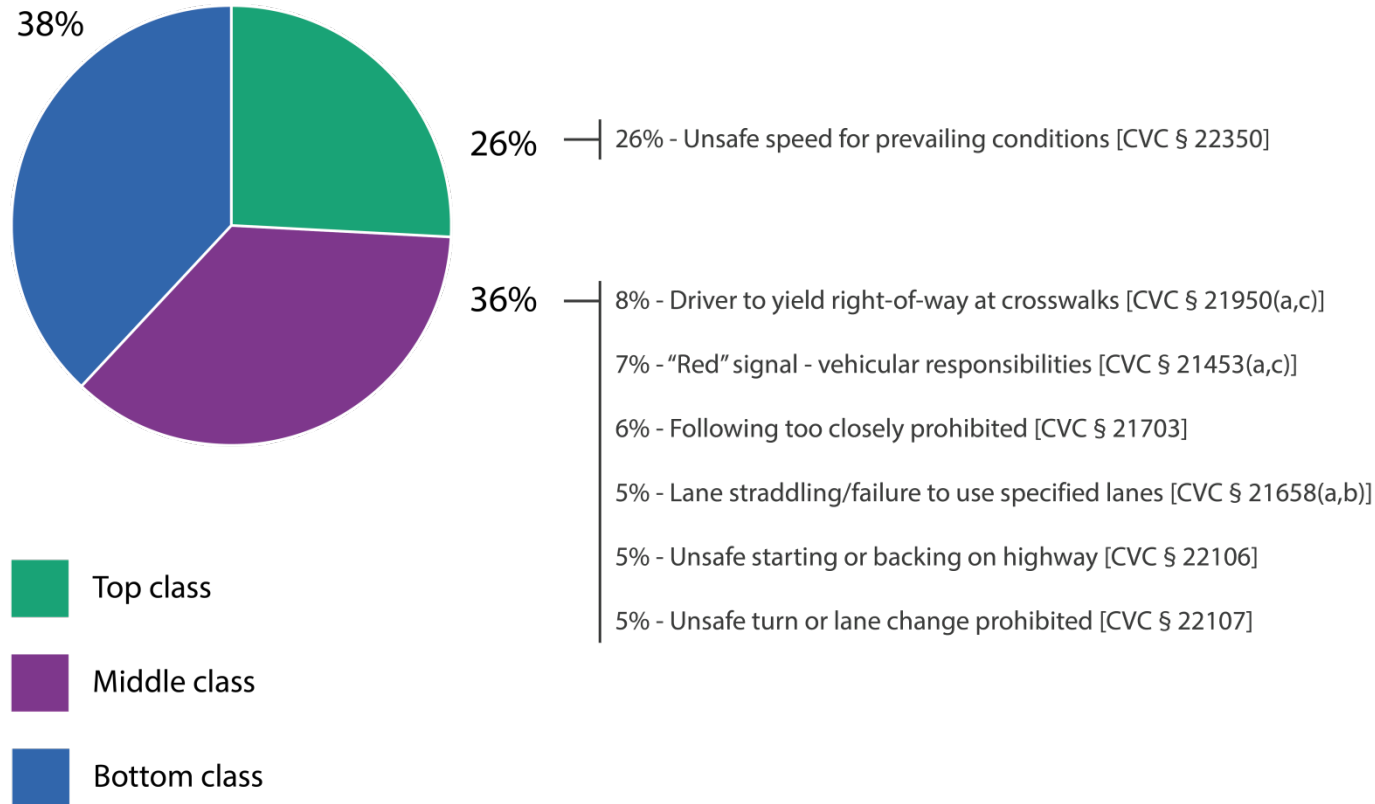


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

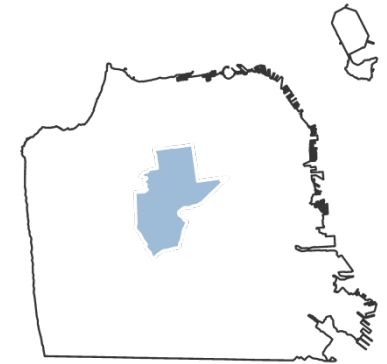


## Distribution of the Primary Collision Factors in the Park District

The top two classes of collision factors<sup>1</sup> account for 62% of collisions with known primary factors<sup>2,3</sup>

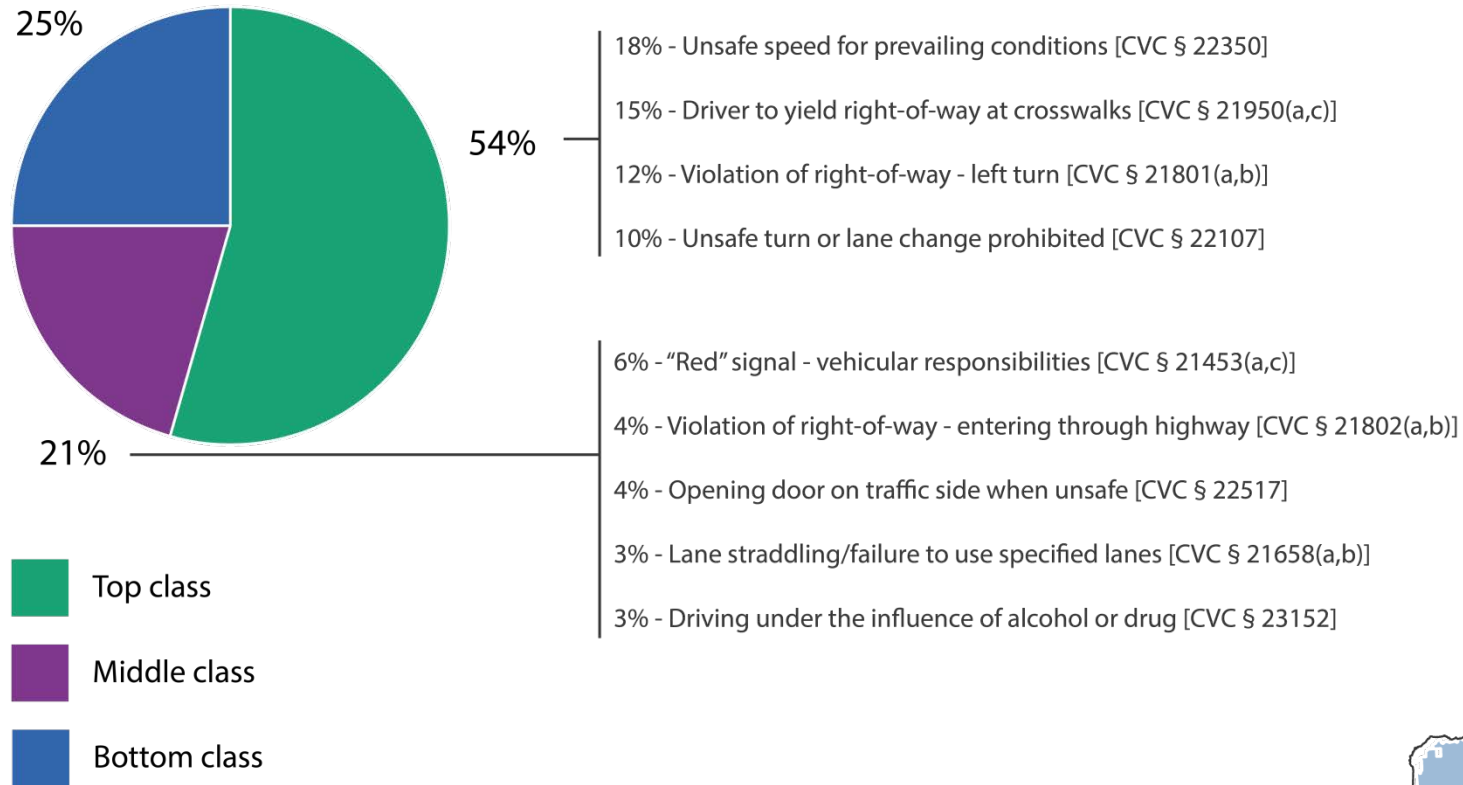


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

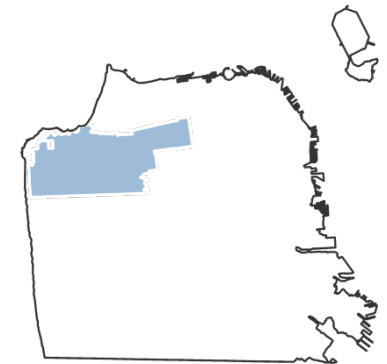


## Distribution of the Primary Collision Factors in the Richmond District

The top two classes of collision factors<sup>1</sup> account for 75% of collisions with known primary factors<sup>2,3</sup>

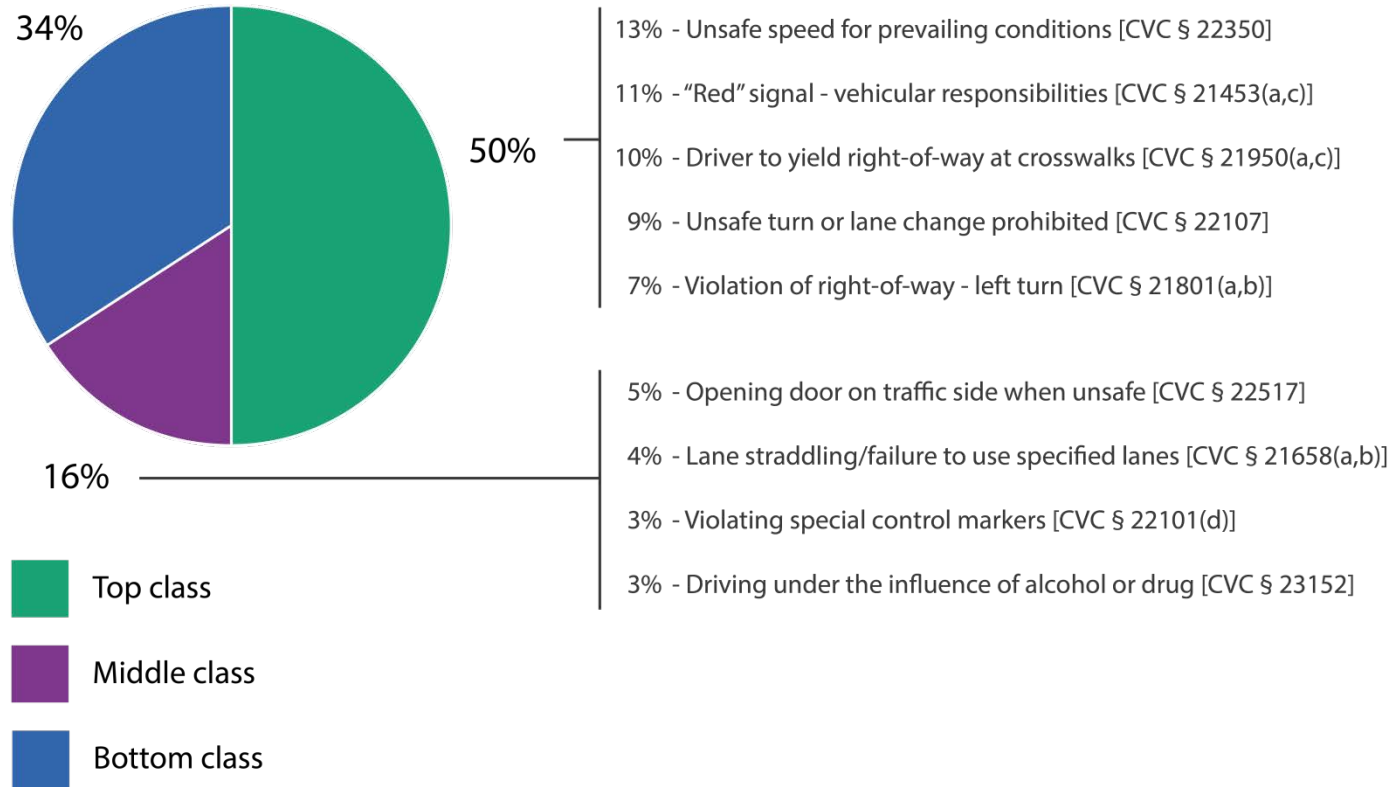


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

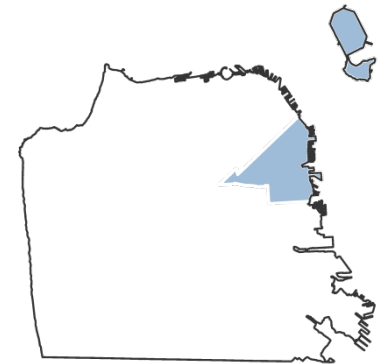


## Distribution of the Primary Collision Factors in the Southern District

The top two classes of collision factors<sup>1</sup> account for 66% of collisions with known primary factors<sup>2,3</sup>



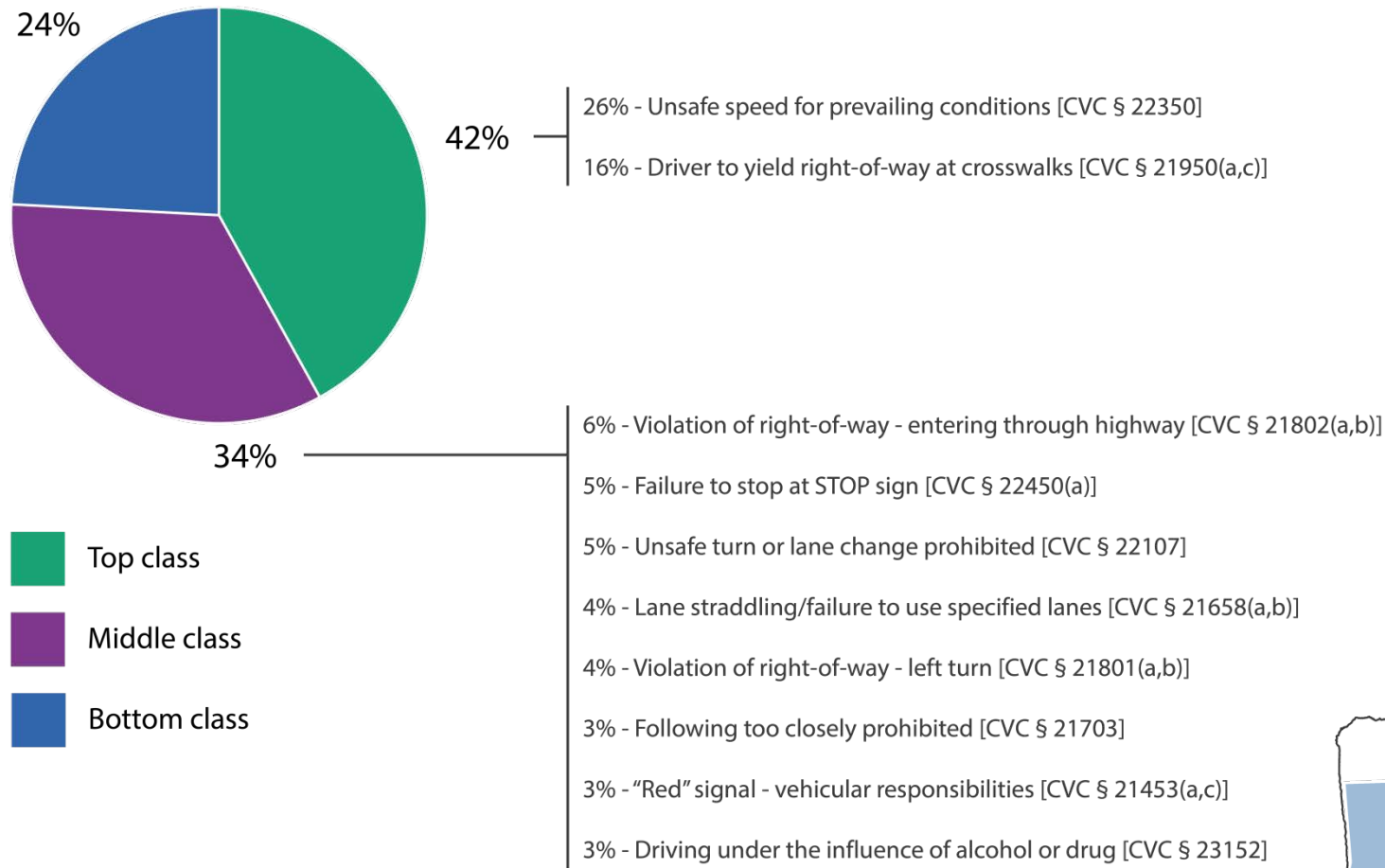
- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding



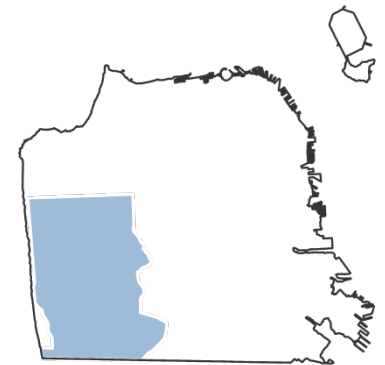


## Distribution of the Primary Collision Factors in the Taraval District

The top two classes of collision factors<sup>1</sup> account for 76% of collisions with known primary factors<sup>2,3</sup>

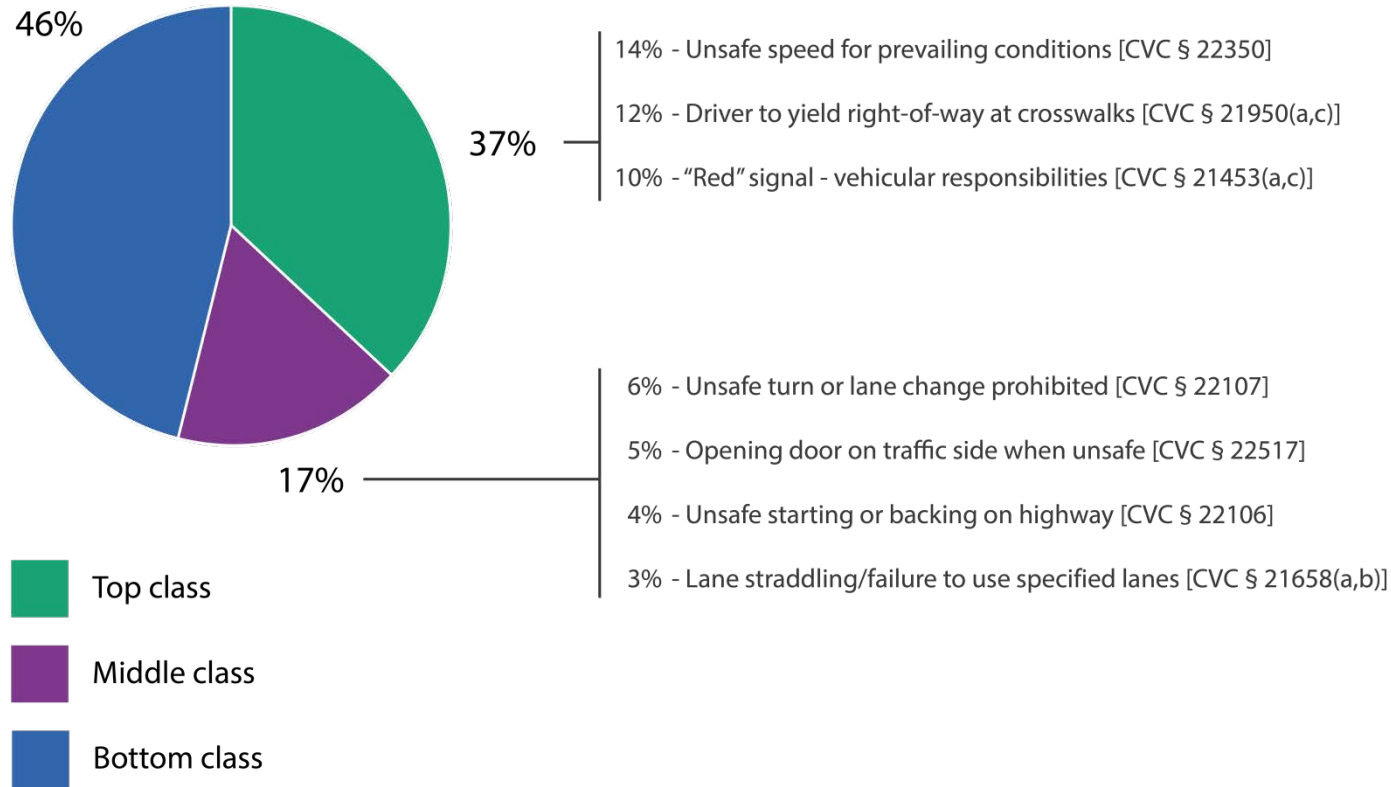


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding

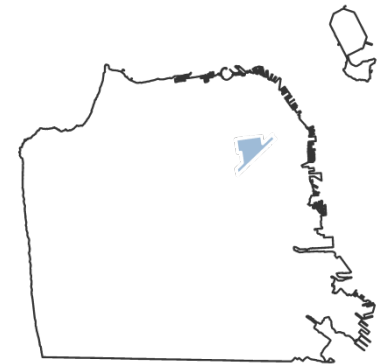


## Distribution of the Primary Collision Factors in the Tenderloin District

The top two classes of collision factors<sup>1</sup> account for 54% of collisions with known primary factors<sup>2,3</sup>

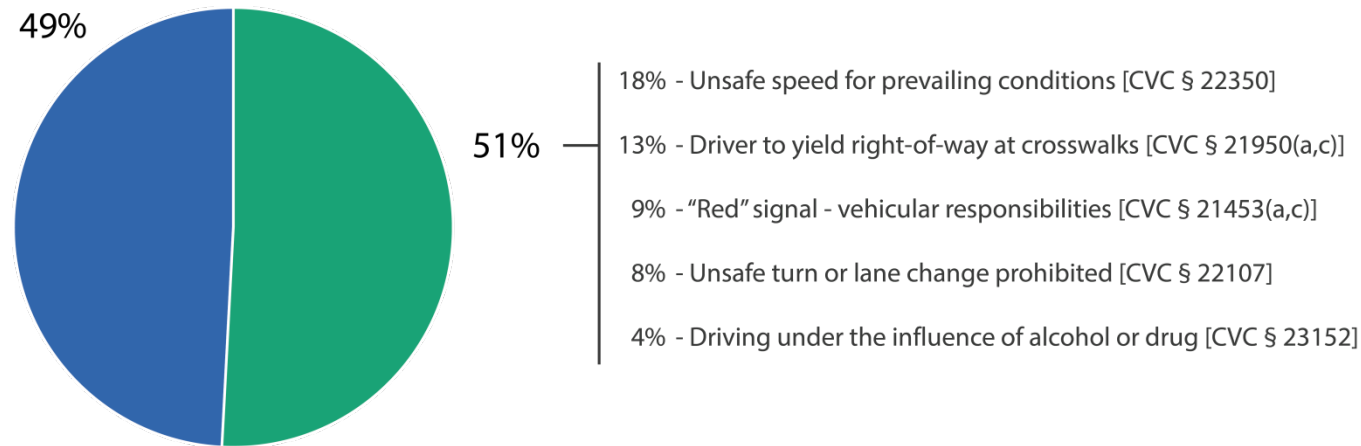


- Notes:**
1. Excluding pedestrian violations of the California Vehicle Code
  2. Excluding complaint of pain cases
  3. Some totals may be slightly off due to rounding



## Distribution of the Primary Collision Factors for the Traffic Company

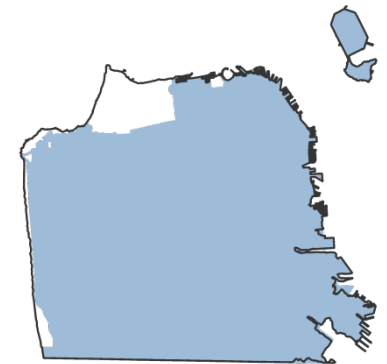
On page 46 we suggest that the Traffic Company focus on the set of collision factors that are common across all districts. As a result, the classes of collision factors for the Traffic Company are not defined in the same way as they are for the district stations. In this case, the “top class” or common set of factors<sup>1</sup> accounts for 51% of collisions with known primary factors.<sup>2,3</sup>



-  Top class
-  Middle class
-  Bottom class

**Notes:**

1. Excluding pedestrian violations of the California Vehicle Code
2. Excluding complaint of pain cases
3. Some totals may be slightly off due to rounding



## Focus on the Five

Education is a major component of the Vision Zero SF strategy and much has been done to inform the public of Vision Zero and the Focus on the Five strategy. To maintain consistency in its messaging and outreach efforts, the SFPD could adopt the more complete list of vehicle code violations below but still retain the Focus on the Five name, with the “Five” instead referring to the five **groups** of dangerous road user behaviors below.

### 1. Speeding and Speed-related Violations

- CVC §21703 – Following too closely prohibited
- CVC §22350 – Unsafe speed for prevailing conditions

### 2. Right-of-Way Violations

- CVC §21453(a,c) – “Red” signal – vehicular responsibilities
- CVC §21950(a,c) – Driver to yield right-of-way at crosswalks
- CVC §21801(a,b) – Violation of right-of-way – left turn
- CVC §21802(a,b) – Violation of right-of-way – entering through highway
- CVC §22450(a) – Failure to stop at a STOP sign

### 3. Impaired & Distracted Driving

- CVC §23152 – Driving under the influence of alcohol or drug
- CVC §23123(a) – Driving while using a wireless telephone not configured for hands-free use<sup>1</sup>
- CVC §23123.5(a) – Driving while using a wireless device to send, read, or write text communication unless the device is used in a hands-free and voice-operated manner<sup>1</sup>

### 4. Turning, Lane Change and Stopping/Starting Violations

- CVC §22107 – Unsafe turn or lane change prohibited
- CVC §21658(a,b) – Lane straddling/failure to use specified lanes
- CVC §22101(d) – Violating special traffic control markers
- CVC §22517 – Opening door on traffic side when unsafe
- CVC §22106 – Unsafe starting or backing on highway

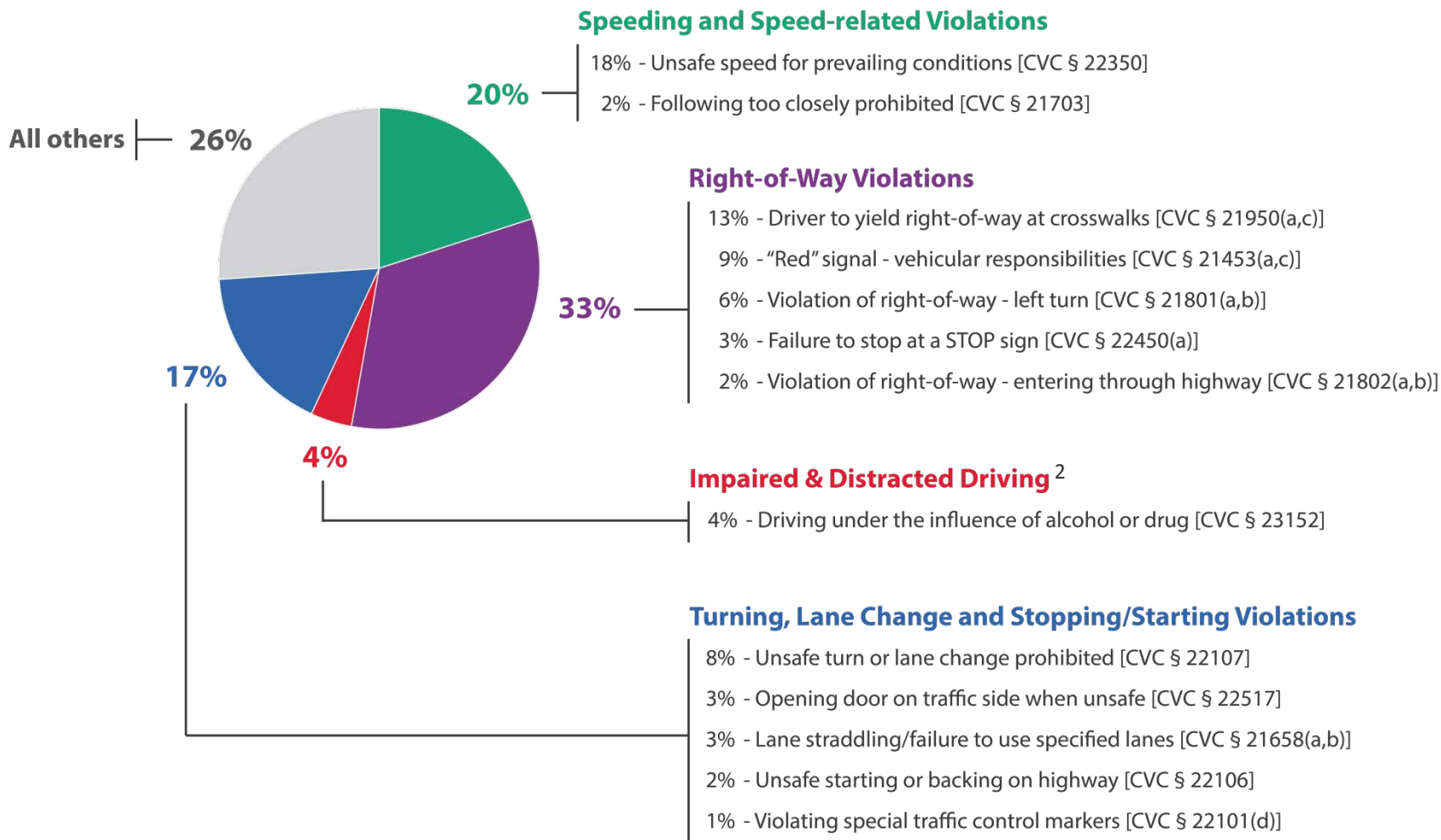
### 5. Community Priorities

1-2 additional district-specific factors based on community input (see pages 47-48 for further discussion)

**Notes:** 1. These offenses are considered “Other Associated Factors” rather than “Primary Collision Factors” for purposes of collision reporting.

## Distribution of the Primary Collision Factors Recommended for Focused Enforcement

The thirteen collision factors we are recommending for focused enforcement collectively account for approximately 74% of collisions with known primary factors<sup>1</sup>



**Notes:**

1. Excluding complaint of pain cases
2. Texting while driving [CVC § 23123.5(a)] and talking on the phone with a non-hands free device [CVC § 23123(a)] are not considered to be PCFs for collision reporting purposes and therefore do not appear in this data

## Considerations regarding Focus on the Five Implementation

Our recommendation to sharpen the Focus on the Five strategy raises a number of potential questions about how it may actually be implemented. Some of these questions are discussed below:

### 1. How would the new goal(s) be structured?

We suggest that each police district establish its own Focus on the Five target based on the list of vehicle code violations on page 32. For example, the Bayview district's Focus on the Five goal would be based on eight factors – namely violations of CVC §§ 22350, 21950(a,c), 21453(a,c), 22107, 23152, 22450(a), 23123(a), and 23123.5(a) – while the Ingleside district's goal would be based on nine factors – violations of CVC §§ 22350, 21950(a,c), 21453(a,c), 22107, 23152, 21801(a,b), 22450(a), 23123(a), and 23123.5(a).

Because the Traffic Company conducts its enforcement operations city-wide, we further suggest that it focus on the behaviors that are common to all of the districts – CVC §§ 22350, 21950(a,c), 21453(a,c), 22107, 23152, 23123(a), and 23123.5(a). These seven factors generally lend themselves to the type of special enforcement operations typically conducted by the Traffic Company whereas district officers have an opportunity to focus on a slightly broader set of factors while out on routine patrols.

In addition to the individual district goals, the SFPD could also establish a department-wide goal that 100% of the districts and the Traffic Company meet their individual targets each month. Thus under this structure, each district station and the Traffic

Company would have their own specific targets and they would all be jointly responsible for performance at a department level.

### 2. At what level should the targets be set?

The current Focus on the Five framework stipulates that 50% of all traffic citations be for one of five specific violations of the vehicle code. Given the proposed expansion in the number of factors, the SFPD could potentially increase its target beyond 50%. However, at this time we are refraining from recommending changes to the level of the target as we do not have sufficient data on which to base such a recommendation. As discussed later on in the report, limitations in the quality of the SFPD's citation data prevented us from analyzing it for this project and that same data would be necessary to inform any proposed changes to the 50% threshold. The Controller's Office could revisit this question once the SFPD has implemented its eCitation initiative and a sufficient amount of data is collected.<sup>1</sup>

- Notes:**
1. As an initial point of reference, the thirteen primary collision factors listed on pages 32 and 44 comprise approximately 74% of the fatal and injury cases (excluding complaint of pain cases) from 2013-2015.

## Considerations regarding Focus on the Five Implementation

### 3. How would the community priorities be determined?

In response to concerns arising from officer-involved shootings and other recent controversies involving the SFPD, Mayor Lee and former police chief Greg Suhr requested that the US Department of Justice (DOJ) Office of Community Oriented Policing Services (COPS) conduct an independent assessment of the SFPD's policies, activities, and operations. After a months-long review process, the reform team uncovered "concerning deficiencies in every operational area assessed" (p. vi). Among other issues, the DOJ noted that it saw avenues for the SFPD to develop strategic partnerships with community based groups but that it missed key opportunities to do so and the DOJ specifically mentioned Vision Zero in this context.

A report issued by the COPS team in October 2016 contains 94 findings and 272 recommendations focused on improving trust between the SFPD and the community through improvements in transparency, professionalism, and accountability. Following the release of this report, Mayor Lee issued a statement committing the SFPD to accepting and implementing all of the recommendations, including one that calls on the SFPD to form strategic partnerships on key community issues in order to develop co-produced policing plans. In the course of implementing this recommendation from the DOJ, it is our recommendation that the SFPD utilize the City's Vision Zero plan and this analysis as a framework for working collaboratively with the community to understand the issue of traffic violence and jointly develop strategies to address it. Such strategies could be based in part on the safety concerns community members have in each district,

which are not necessarily reflected in the results of our analysis. For example, some Vision Zero stakeholders we have spoken with have expressed concerns about the frequency at which they see cars blocking the bike lanes in certain neighborhoods, while others have noted that they feel vulnerable and exposed when forced to walk outside of a crosswalk when a vehicle is blocking the box at an intersection.

As Walk San Francisco underscored in its recent *Street Score 2016* report, the potential exists for developing more innovative solutions by coupling the City's quantitative data with qualitative data from community members who travel their streets every day. This sentiment is also echoed in the soon to be released 2017-2018 Vision Zero SF Action Strategy, which recognizes the need to improve engagement with our neighbors and obtain more feedback from people who have thus far been underrepresented in the process. Consistent with these points of view, the Focus on the Five framework we are suggesting here leaves room for the SFPD to incorporate public input into its performance goals to the extent that safety concerns beyond those identified by our analysis are raised with the SFPD during its public engagement processes and to the extent the SFPD believes those issues deserve focused attention. Accordingly, we recommend that the SFPD utilize the City's Vision Zero action strategy as a framework for working collaboratively with the community to develop strategies to address traffic violence and consider incorporating specific community concerns into its Focus on the Five goals.

## Considerations regarding Focus on the Five Implementation

### 3. How would the community priorities be determined? (continued)

Furthermore, the assessment report issued by the US DOJ's COPS team emphasizes that if the SFPD is to rebuild community trust it must engage with the public. Based on Mayor Lee's and the SFPD's recent commitments to implementing 479 recommendations it has received over the last 18 months from the Blue Ribbon Panel, US DOJ, Civil Grand Jury, and other sources, we additionally recommend that the SFPD develop and publicly report on measures related to procedural justice and social equity in traffic enforcement.

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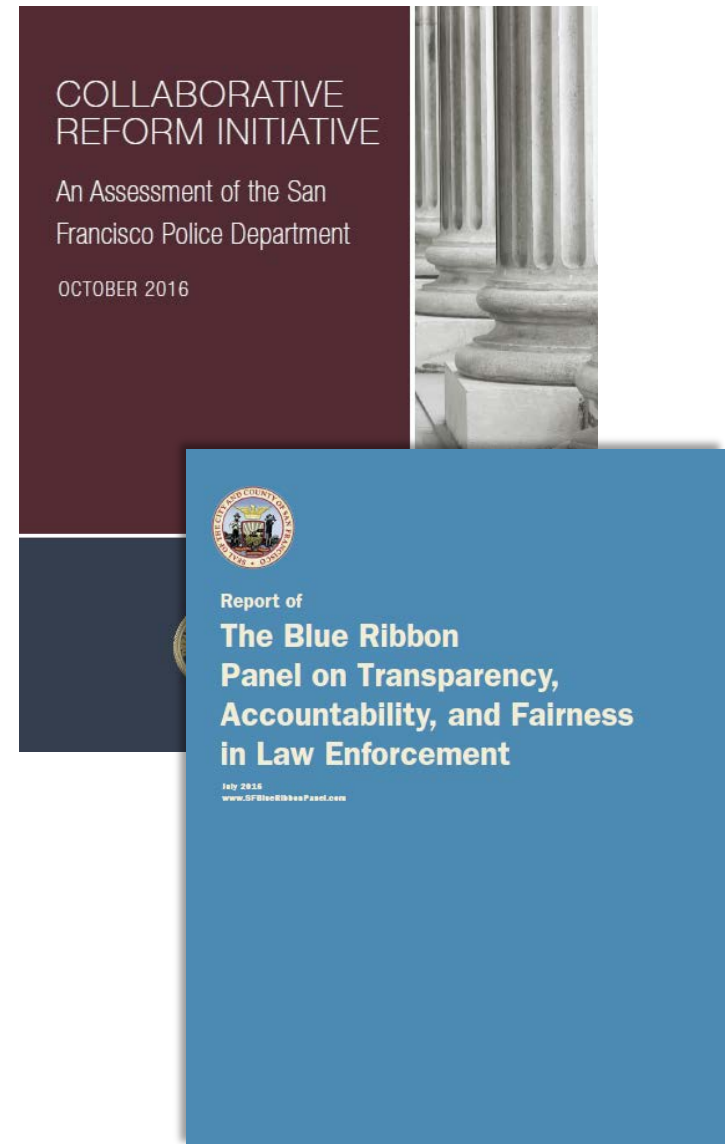
#### **Recommendation 3**

*In implementing the recommendations of the DOJ, the SFPD should utilize the City's Vision Zero Action Strategy as a framework for working collaboratively with the community to understand traffic violence and jointly develop strategies to address it. As appropriate, the SFPD may additionally consider incorporating specific community concerns into its Focus on the Five goals.*

#### **Recommendation 4**

*The SFPD should develop and publicly report on measures related to procedural justice and social equity in traffic enforcement.*

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## Considerations regarding Focus on the Five Implementation

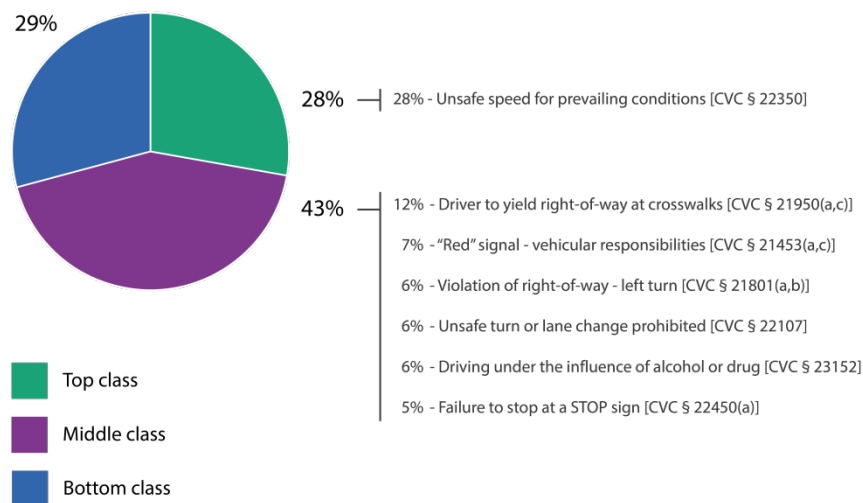
### 4. Would increasing the number of vehicle code violations make the Focus on the Five campaign unfocused?

No. As the table on page 32 shows, the factors that contribute to the greatest number of traffic collisions are not necessarily the same from one police district to another and by conducting our analysis at the police district level, we have achieved greater alignment between the collision data and the deployment of the SFPD's traffic enforcement resources.

Under the framework that we are suggesting, the number of factors on which a given company would focus ranges from seven for the Traffic Company to twelve in the Taraval district. While such an expansion may seem drastic compared to the current goal, it is important to keep in mind that the city-wide list of collision factors in Appendix D contains no less than 91 different items, and the Uniform Bail and Penalty Schedules published by the California Judicial Council (2017) identifies many times that number of potential traffic violations under the whole of the California Vehicle Code. Thus, with district-level goals based on seven or even twelve different factors, the SFPD will still be focused on a relatively small fraction of the offenses that road users may commit. Moreover, the charts on pages 33 through 43 illustrate how such a small expansion in focus can potentially yield significant safety benefits. For example, the chart for the Ingleside District (also shown at right) shows that speeding (CVC § 22350) accounted for 28% of the fatal and injury collisions from 2013 through 2015 (excluding complaint of pain cases). We acknowledge that this speaks to the importance of focusing on speed in particular. However, we must also

acknowledge that the goal of Vision Zero is to eliminate all traffic deaths, not just those related to speed. And by prioritizing a mere six additional factors out of potentially hundreds (i.e., the six factors that make up the “middle class” in our grouping analysis), officers in the Ingleside District can address more than 70% of the most serious collisions in their jurisdiction. Similar arguments can be made for the other SFPD districts as shown in the preceding charts.

Percentage of Fatal and Injury Collisions in the Ingleside District



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## **Collision Data Pertaining to the Time of Enforcement**

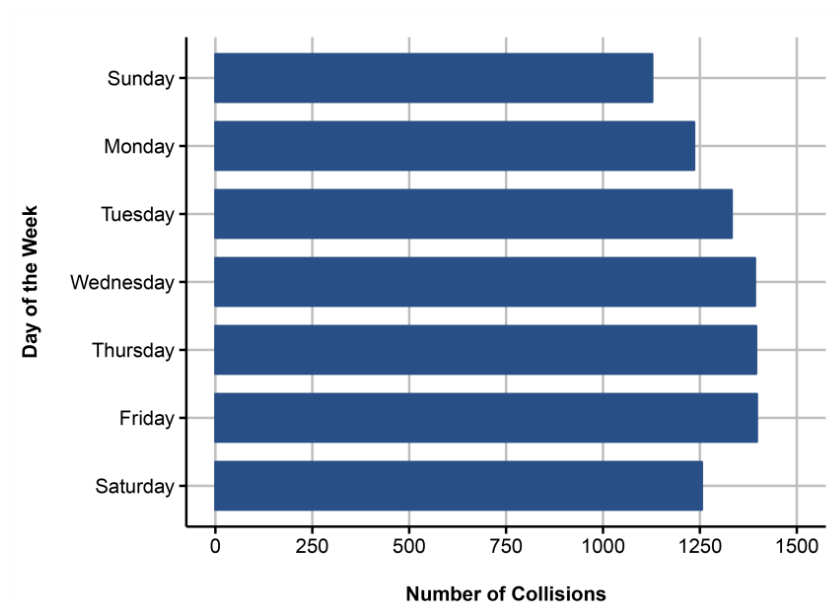
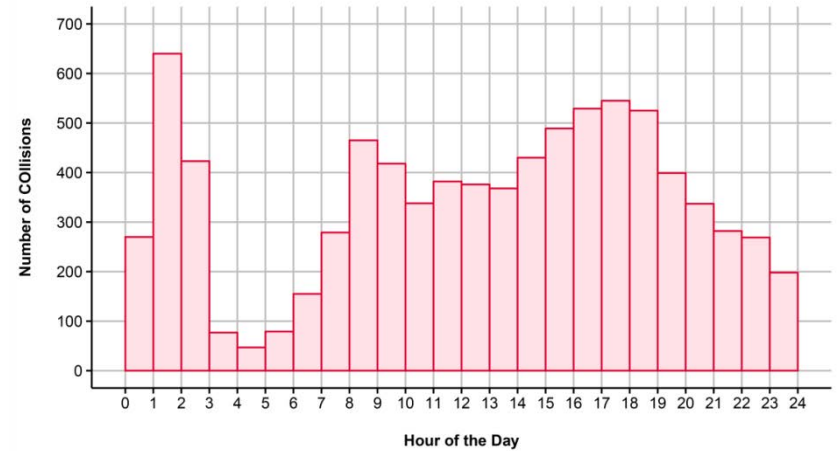
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## When Collisions Occur – Time of the Day and Day of the Week (2013-2015)

In general, the data indicate that collisions typically occur at all hours of the day but there are spikes during the morning and evening commutes as well as during the 1 o'clock hour in the early morning; there is also a noticeable dip from 3:00 am to 6:00 am. The data also show that collisions are equally spread among the days of the week.

### Recommendation 5

*Consistent with our recommendations that the SFPD broaden the spatial extent of its traffic enforcement activities and the range of illegal behaviors on which it focuses, the SFPD should similarly ensure that the temporal scope of its operations is sufficient to deter illegal driving behaviors at all times throughout the day and over the course of a week.*





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## **Strategies for Maximizing General Deterrence**

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## Increased Enforcement Activity

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## Increased Enforcement Activity

### Case Study: Enhanced Traffic Enforcement as a Simple and Effective Injury Prevention Program

To investigate whether an enhanced traffic enforcement program can reduce motor vehicle crashes, injury collisions, and fatalities, a pilot project was conducted in Fresno, CA using grant funding from the California State Office of Traffic Safety. During program implementation, the traffic division of the Fresno Police Department increased from 20 to 84 officers. Data were collected for the year before program onset (2002), during the first year (2003) and the year after full implementation (2004).

- Analysis showed that the number of **moving violation citations** issued within the city of Fresno **increased significantly**, with 6% of the population receiving citations in 2002 and 17% in 2004.
- At the same time, **injury collisions decreased significantly**, **fatalities from collisions decreased twofold**, and **speed related fatalities decreased threefold**.
- **Similar decreases were not seen elsewhere throughout the county** where the enhanced enforcement program was not implemented.

#### Conclusions

“This is a **simple, easily implemented** injury prevention **program with immediate** and potentially on-going **benefit**” [emphasis added]

“For the community to realize long-term benefit from the [enhanced] enforcement program, it will **need to be on-going and permanent.**” [emphasis added]

## Increased Enforcement Activity

Additional research findings regarding the level of enforcement activity:

### *The Effectiveness of Traffic Policing in Reducing Traffic Crashes*

Bates, Soole & Watson, 2012, p. 98

“Arguably the **most common feature of successful programs is high, sustained levels of enforcement** conducted with the aim of increasing the perceived risk of detection...” [emphasis added]

### *Traffic Law Enforcement: A Review of the Literature*

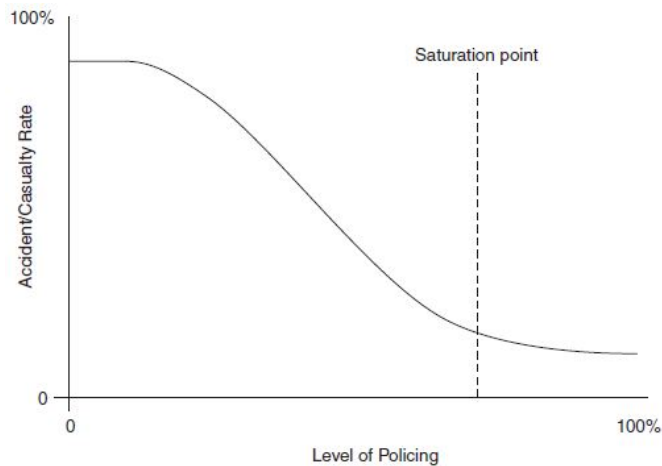
Zaal, 1994, pp. 10, 12

“One recognized means of increasing perceived detection risk is to **increase the actual level of enforcement activity.**” [emphasis added]

“The large volume of literature relating to the deterrence based approach to traffic law enforcement suggests that, **in order to be effective, policing activities need to be structured so as to pose a meaningful and immediate deterrence threat to the would-be traffic offender.** One of the fundamental problems hindering this process, which has been consistently identified in the research literature, is the inability of authorities to maintain the necessary high levels of enforcement. One of the main factors contributing to this situation is insufficient policing resources.” [emphasis added]

## Increased Enforcement Activity

The question of how much enforcement activity is necessary in order to achieve a desired reduction in the number of collisions or traffic violations is difficult to answer.



Source: Reproduced from Elliott & Broughton (2005)

It is theorized that the relationship between these variables follows an S-shaped curve. Collisions or violations should be at their highest with zero enforcement, and the number should drop (slowly at first) as road users become aware of the police presence. However, at some point (the “saturation point”) additional increases in enforcement activity would begin to have less of an impact because collisions are caused by a number of different factors, which may or may not be related to violations of traffic laws.

Further research would be needed to determine where San Francisco currently lies on this curve but the results of such a study could be helpful in determining the optimal level of enforcement given the costs and the expected benefits.

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### **Recommendation 6**

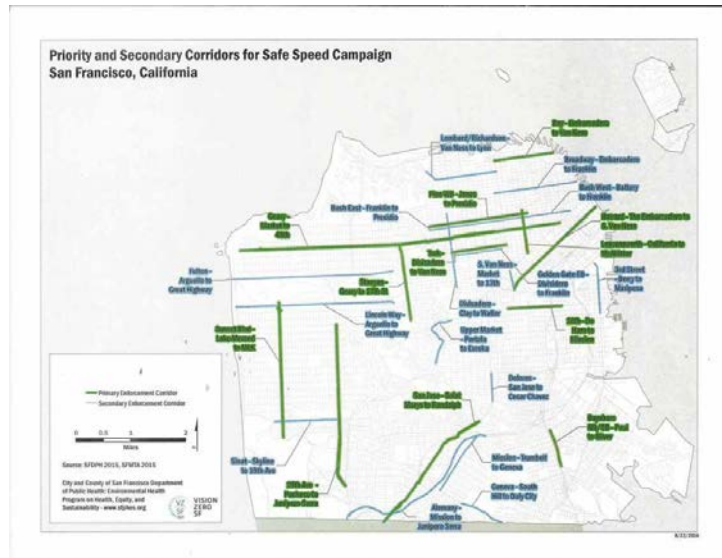
***The SFPD should consider the feasibility of measuring the level of effort it dedicates to traffic enforcement if it wishes to further explore the relationship between the level of policing and the rates of traffic collisions or violations in San Francisco.***

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## Safe Speeds SF Campaign

On September 29, 2016, the SFPD, SFMTA, and SFDPH launched a year-long joint effort to increase speed enforcement along twelve priority corridors and fourteen secondary corridors throughout the City. Funded by a \$2 million state grant, the campaign will use newly acquired LIDAR speed detection units and will dedicate an additional 132 hours per week to speed enforcement. The program will also include education and outreach in the affected areas as well as an evaluation of its effectiveness.



Elsewhere in this report we noted that effective enforcement programs are marked by high rates of detection, which are sustained over a long period of time. We expect that while it is in place over the next year, the new Safe Speeds SF campaign will go a long way to increase public awareness of the dangers of speeding and it will in fact deter drivers from engaging in this unsafe behavior. However, research tells us that the effect of the campaign may be short lived once it is stopped and in order for the benefits to persist, the effort must be ongoing. Thus in addition to evaluating the effectiveness of the campaign in reducing average vehicle speeds or the number of speeding vehicles, we recommend that the City also carefully evaluate the implications such an effort would have on the SFPD’s resources should the campaign extend beyond the one-year pilot period.

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### Recommendation 7

*In evaluating the Safe Speeds SF campaign, the City should not only evaluate its effectiveness in reducing average vehicle speeds and the number of speeding vehicles, but it should also evaluate its impact on the SFPD’s resources and consider how sustainable the program is over the long term.*

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## **Automated Speed Enforcement**

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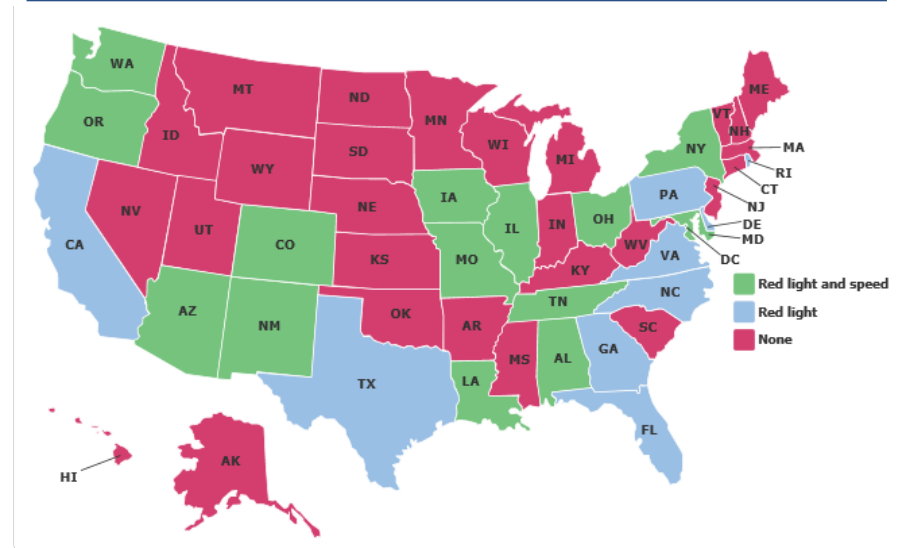
## Automated Speed Enforcement

Automated speed enforcement (ASE) is a method of traffic enforcement that uses speed sensors and cameras to detect and identify vehicles that travel faster than a defined threshold. Images captured by ASE cameras are processed and reviewed for validity, and violations are reviewed and verified prior to issuance of a citation. Although the use of this technology is currently not allowed in the state of California, the Vision Zero Two-Year Action Strategy calls for its advancement at the state level as it has a number of advantages:

1. It substantially increases the probability of detection at the site of its use and thus serves as an effective deterrent.
2. It increases the continuity and efficiency of policing operations. When a motorist is stopped by the roadside for a speeding offense, enforcement activity typically “pauses” while the officer issues a citation. During this pause, other motorists who speed through the enforcement site go undetected. Automated speed enforcement eliminates this pause in enforcement.
3. It frees up valuable, and often limited, police resources for other aspects of traffic enforcement or other activities that require manned operations.

4. It facilitates enforcement at road locations that are not amenable to manned operations.
5. It produces conclusive evidence that an offense has occurred and thus increases the fairness and objectivity of enforcement.

### States that allow the use of Automated Enforcement



## Automated Speed Enforcement

### Performance Data on the Effectiveness of Automated Speed Enforcement

A review conducted by The Cochrane Collaboration of 35 prior studies revealed a number of road safety benefits with respect to the effectiveness of speed enforcement detection devices. In particular, they found:

- **reductions in average vehicle speeds by up to 15%**, and
- **reductions of up to 65% in the proportion of speeding vehicles.**

Moreover, all studies with documented crash outcomes reported reductions in the vicinity of enforcement locations. Notably:

- **fatal and serious injury crashes were reduced by up to 44%**,
- **injury crashes were reduced by up to 50%**, and
- **crashes overall were reduced by up to 49%.**

These research findings are consistent with the results of a survey of several jurisdictions conducted by the San Francisco Controller's Office in 2015. In particular:

- Between December 2012 and December 2014, **Seattle reported a 64% decrease in the average number of traffic citations** with its fixed camera program in place,
- Chicago reported a **31% reduction in speeding vehicles** with the use of ASE, and
- Authorities in **Portland, Oregon reported a 53% reduction in fatalities** since inception of their program and **Washington, D.C. reported a 70% reduction.**

## Automated Speed Enforcement

Additional research findings regarding the level of enforcement activity:

### ***Traffic Law Enforcement: A Review of the Literature***

Zaal, 1994, pp. 10, 12

“[Researchers] highlight the need for the deterrence process to be based on **pro-active rather than reactive** enforcement measures and **stress the use of intensive, long term, high volume detection systems (advocating the use of automated enforcement devices) as a possible means of achieving this objective.**” [emphasis added]

“...the problem with traditional enforcement methods is that the limited policing resources available, as compared to the relatively high number of speeding motorists, results in a low perceived risk of apprehension.... Drivers soon realise that at anyone time only a small part of the entire traffic network is subject to enforcement, and hence, the risk of apprehension is extremely low...

...solutions to this problem have focused on the development of enforcement strategies which increase the level of deterrence without substantial increases in existing policing resources.... **Enforcement strategies based upon the use of automated speed detection technology have been consistently identified as the most effective way of achieving these objectives...**” [emphasis added]

## Automated Speed Enforcement

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### *Recommendation 8*

*In light of scientific research which shows that effective traffic enforcement programs should be based on proactive rather than reactive measures, and given the proven efficacy of automated speed enforcement in preventing fatal and serious injury collisions, the City and County of San Francisco should continue to advance the use of automated speed enforcement as a tool for encouraging people to drive at safe speeds.*

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## Targeted Enforcement

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## Targeted Enforcement

Targeted enforcement refers to the use of crash, citation, and other data to identify specific times or locations where traffic crashes or offenses are most likely to occur and thus where a department will focus its enforcement operations. The rationale behind such a strategy is that it is practically impossible for a department to police the entire road network within its jurisdiction and that the most efficient use of the available resources calls for their deployment to the locations within the network where the greatest reductions in collisions are needed.

However, earlier in this report we cited a body of research, which suggests that in some circumstances, a targeted approach to traffic enforcement can be counterproductive to a department's goals – for example when it is relied on so extensively that enforcement becomes predictable, when enforcement sites are not carefully selected, and when traffic incidents are spread across a wide area. For all of these reasons we recommended that the SFPD seek out opportunities to extend its enforcement presence beyond the HIN.

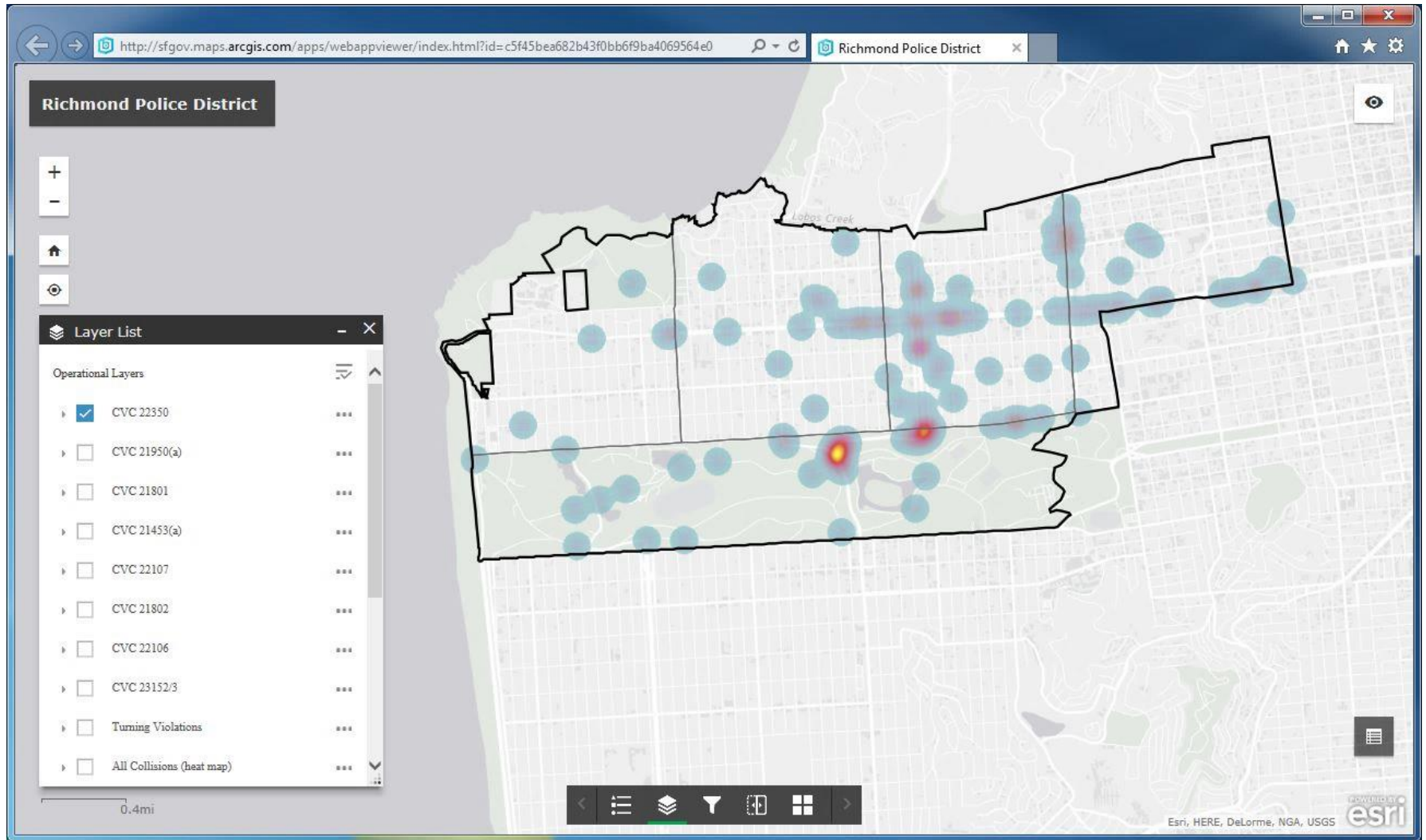
In an effort to balance this recommendation with the practical reality that the SFPD must still target its limited resources on select locations to some degree, we have created an online resource that can assist the SFPD in selecting alternative enforcement sites in a data driven manner at both the district and sector levels. Additionally, other City staff and the public can use these maps to explore the collision data in greater depth and identify locations that may benefit from interventions other than enforcement. This online application is available at <http://sfcontroller.org/collisiondata>. Eventually, this functionality could be incorporated into SF DPH's TransBASE system, which serves as a central repository for all public health-related transportation data in San Francisco.



SF Road Network



## Online Tool for Exploring District-level Collision Data



## Collisions in the Richmond District Caused by a Driver's or Bicyclist's Failure to Yield to a Crossing Pedestrian

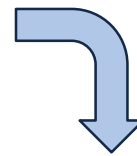
In the Richmond District, for example, 78 collisions occurred from 2013 to 2015 when a driver or bicyclist failed to yield to a crossing pedestrian. As the heat map reveals, many of these occurred at points along the HIN (shown in blue) although there is one notable cluster that is not on the HIN. There are also additional areas not on the HIN that may warrant increased attention even though the collisions are slightly more sparse.

High Injury Network

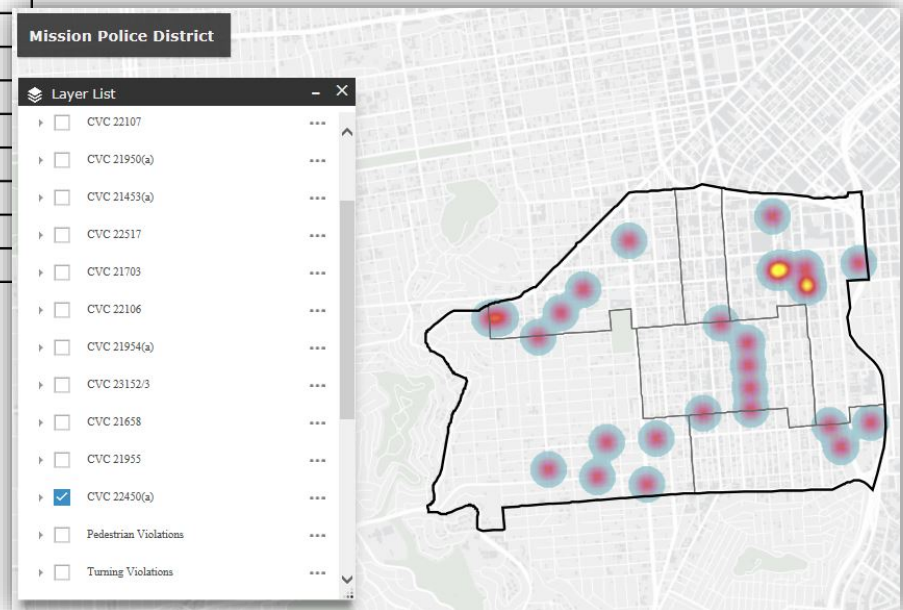


## Results of PCF Clustering Analysis

PCF	Description	Mission
22350	Unsafe speed for prevailing conditions	X
21950(a,c)	Driver to yield right-of-way at crosswalks	X
21453(a,c)	"Red" signal - vehicular responsibilities	X
22107	Unsafe turn or lane change prohibited	X
23152	Driving under the influence of alcohol or drug	X
21801(a,b)	Violation of right-of-way - left turn	X
22517	Opening door on traffic side when unsafe	X
21658(a,b)	Lane straddling/failure to use specified lanes	
21955	Crossing between controlled intersections (Jaywalking)	X
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	X
22450(a)	Failure to stop at STOP sign	
22106	Unsafe starting or backing on highway	
21703	Following too closely prohibited	
21802(a,b)	Violation of right-of-way - entering through highway	
21453(d)	"Red" signal - pedestrian responsibilities	
21950(b)	Pedestrian right-of-way at crosswalks regulated	
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	
22101(d)	Violating special traffic control markers	
	<b>Count</b>	<b>9</b>



The top two classes of PCFs for each district have been incorporated into the online maps



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## Random Deployment

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## Random Deployment

Random deployment refers to the random allocation of stationary policing methods throughout a road network. Underlying this approach is the idea that it increases a driver's perceived risk that traffic offenses will be observed by police because drivers are unable to predict where and when enforcement will occur. Like targeted enforcement, random deployment has the added advantage that it can be carried out with varying levels of resources.

### Performance Data on the Effectiveness of Random Deployment

A literature review conducted by TRL Limited on behalf of Transport for London cites several studies, which suggest that random deployment can have desirable effects:

- Edwards & Brackett (1978) evaluated the effectiveness of random deployment along 27 km of rural road and observed a **3 mph reduction in mean speeds**.
- Brackett & Beecher (1980) conducted an 18-month study in which speeding behavior on 24 experimental roads was compared to 24 control roads in Texas. A **9% reduction in the proportion of speeding vehicles** was observed across the experimental road group.
- A 1988 study in Australia (Leggett) on three stretches of rural highway over a two year period showed a **58% reduction in fatal and serious collisions** compared to a 4.2% reduction in control areas.
- A program implemented in Queensland, Australia was **estimated to reduce fatal collisions in urban areas by 26%, serious injury collisions by 21%, and minor injury collisions by 13%**.

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## Saturation Patrols

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## Saturation Patrols

Saturation is a strategy in which a large number of officers conduct enforcement within a relatively small geographic area. Often used to address the problem of driving under the influence (DUI), saturation patrols can drastically increase the probability that offenders in a particular area will be detected and apprehended. At the same time, however, such operations can be resource-intensive, particularly when they are coordinated with other departments (e.g., the California Highway Patrol). Also, research suggests that the impact of such short term, high intensity 'blitzes' may be short lived after the saturation event has ended.

As reported in Zaal (1994), some researches have suggested that a saturation type of approach could be used to mitigate the shortcomings of other strategies such as targeted enforcement. In particular, they suggest stationing two or more units a short distance apart from each other at the same time in order to create a perception among road users of increased enforcement activity and create uncertainty about the presence of additional officers further down the road. In addition, such a strategy may help to alleviate the pause in enforcement that occurs when an officer issues a citation to an offending road user.



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## **Additional Considerations**

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### Collection and Maintenance of Traffic Stop and Citation Data

The Controller's Office embarked on this project in response to a desire by the SFMTA and DPH to better understand the spatial and temporal relationship between enforcement activity and collisions. The initial aim of the project was to analyze historical citation data in order to shed light on important questions like how extensive the SFPD's traffic enforcement presence is throughout the City, the degree to which the SFPD's traffic enforcement activities are concentrated in certain areas, and how the SFPD's activities and the resulting citations relate to the HIN. However, our ability to spatially analyze the SFPD's citation data is currently limited by the lack of standardization in the way that location information is initially captured in a citation when one is issued. Notably, most citations in the city are issued using a paper form, and the issuing officer may describe the location of an offense in any number of ways. In addition, although the SFPD's Traffic Company currently uses electronic handheld devices to issue traffic citations, the location information is entered in those devices as free text as well. The resulting variability in the way that citations are completed makes it virtually impossible to use automated methods to convert the location information into geographic coordinates for analysis. In fact, even after obtaining several hundred records of sample data from the Northern District and manually reviewing each one individually, we were still unable to ascertain the location of the offense in a large number of cases. Given these issues, it is difficult to consider questions about the effectiveness of traffic enforcement in San Francisco in depth.

The collection of complete and accurate stop data is also important from a resource management perspective. For example, citations alone do not reflect the total level of effort the SFPD dedicates to traffic enforcement because some stops result in a warning rather than a citation. Currently, officers are required to complete an E-585 traffic stop incident report to record all vehicle stops whether they result in a warning or a citation, but the assessment recently conducted by the US Department of Justice found that the E-585 data is not complete. In particular, while the E-585 form states whether a stop resulted in a citation, it does not specify the nature of the offense. It is also not practical to link E-585 forms to any associated citations. In addition, the US DOJ found that the SFPD does not routinely and consistently collect data for cyclist and pedestrian stops.

*continued on next page...*

## Collection and Maintenance of Traffic Stop and Citation Data (continued)

As the recent assessment by the US DOJ illustrates, the importance of collecting and maintaining complete and reliable traffic stop data goes beyond the issue of traffic safety alone. These data are also crucial for identifying potential racial and ethnic disparities in officer initiated traffic stops, and ultimately in building a foundation of trust with the community. For all of the foregoing reasons, we recommend that the SFPD work quickly to implement its eCitation and eStops<sup>1</sup> initiatives. In doing so, the SFPD should work with its Vision Zero partner agencies to ensure these systems will support quality data analyses.

Once the eCitation and eStops applications have been implemented and more complete data are available, the Controller's Office could conduct additional analysis to further inform deployment of the SFPD's resources and to support the Vision Zero action strategy.

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### ***Recommendation 9***

***The SFPD should work quickly to implement its eCitation and eStops initiatives and in doing so, it should work with its Vision Zero partner agencies to ensure they will support quality data analyses.***

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**Notes:** 1. eStops is a mobile application in development to replace the current paper-based E-585 traffic stop incident reports and include all encounters.

## Migration of Collision Reporting to the SFPD's Crime Data Warehouse

While the SFPD's collision data are substantially better than its citation data, the collision data are not without their own issues and limitations. In particular, when analyzing the primary collision factors for this project, we found inconsistencies in the way the primary collision factors are coded. For example, violations of CVC 21453(a) (failure to stop at a red light) were most often recorded as "21453 A", but notations such as "21453 A0", "21453 AVC", and "21453 AX" were also used. In addition, we found numerous cases where the primary collision factor column referred to nonexistent sections of the California Vehicle Code and to sections of the CVC that are not valid primary collision factors. Finally, we found cases where a valid section of the CVC was referenced but a necessary reference to the appropriate subsection of the code was missing. These inconsistencies made our analysis considerably more time consuming and they introduced a greater potential for error. In addition, a December 22, 2016 memorandum from DPH to the SFPD outlines numerous other data quality issues that DPH and the SFMTA have encountered; both agencies have spent a significant amount of time attempting to resolve these issues over the last several months.

We understand that SFPD senior management has made a decision recently to migrate its collision reporting functions to the department's Crime Data Warehouse (CDW). Because the CDW is significantly more robust than the system that the department currently uses and it can be designed to address many of the issues that we have observed, we believe this move will greatly enhance the quality of the data and our collective ability to analyze it, and we look forward to working with the SFPD to carry out this initiative. Beyond that, however, the SFPD may also want to consider whether its officers could benefit from periodic re-training in the area of collision reporting and investigation. As we understand it, the police academy curriculum includes a 40-hour Basic Traffic Collision Investigation course but this may be the only training a typical officer receives in this area over his or her entire career. While it may not be necessary for every officer to repeat the entire 40-hour class, a condensed refresher training may help to yield more complete and accurate collision reports.

### **Implications of the Hot Spot Analyses with Respect to City-wide Resource Allocation within the SFPD**

Both the hot spot analysis shown on page 17 and the emerging hot spot analysis provided in Appendix C are notable in that while a statistically significant concentration of collisions covers much of the northeast quadrant of the city, there are few hot spots elsewhere throughout the city. Based on these results, some may question how much of the SFPD's resources should be dedicated to preventing collisions in the northeast section of the city over other areas. Such questions are important and indeed worth considering but they are also complex. How resources are allocated among the district stations and the number of officers that should be assigned to patrol functions depend on many factors such as the number of calls for service in a particular area, officer response times, crime rates, and geography among others. Such considerations are beyond the scope of this report.



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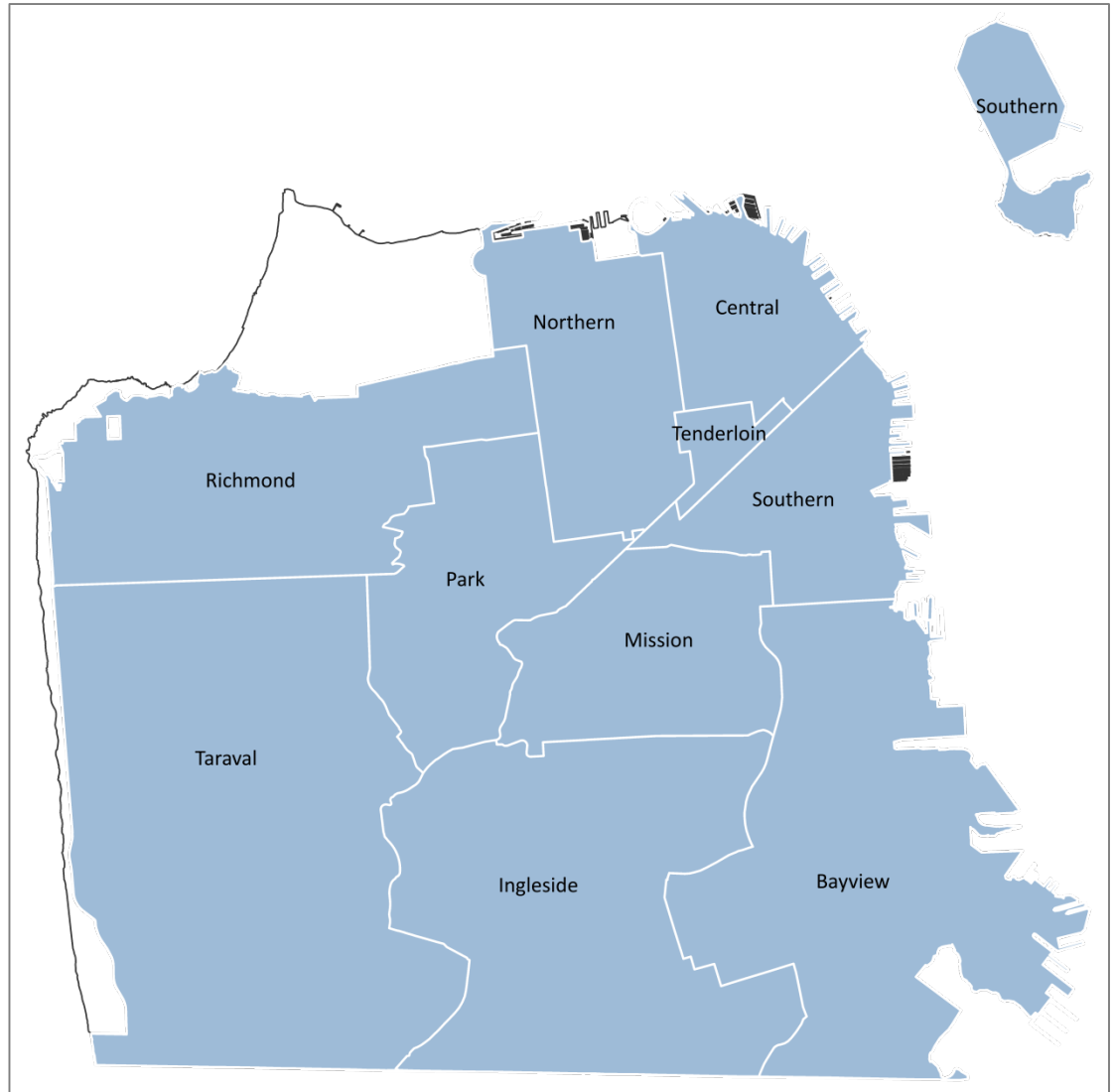


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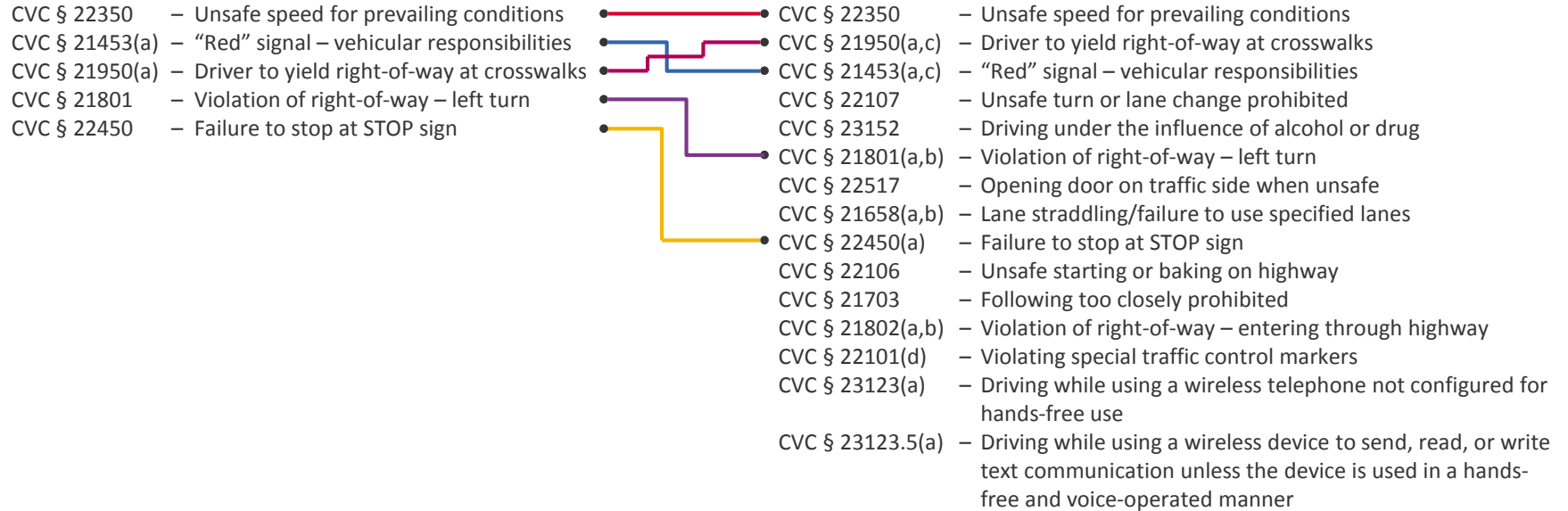
## Appendices

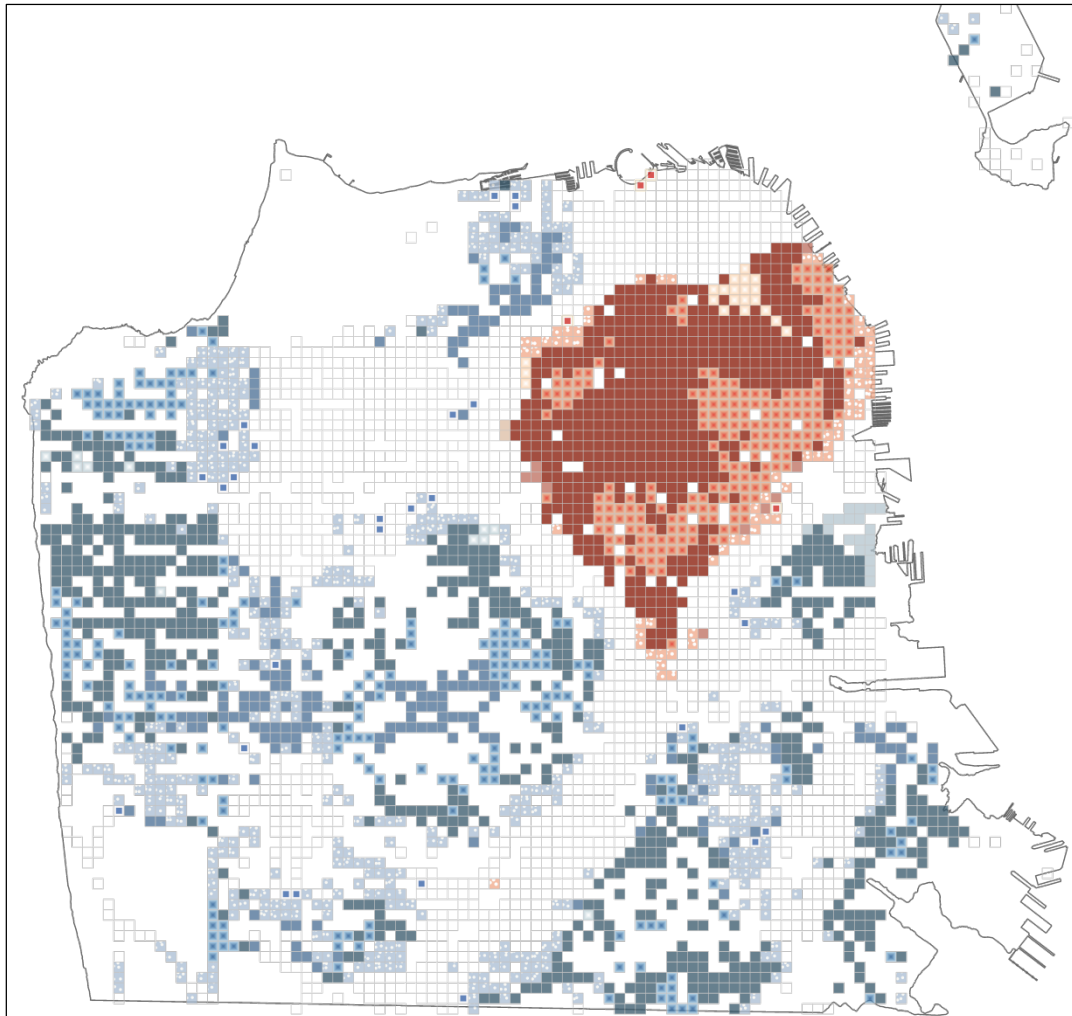
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## San Francisco Police Department District Boundaries



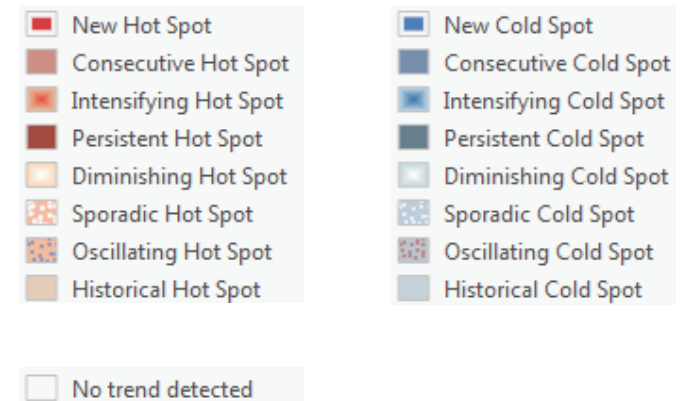
## Comparison between the Current and Recommended Focus on the Five Behaviors





## Emerging Hot Spot Analysis (2005-2015)

The hot spot analysis presented on pages 17 and 18 is limited to data from 2013 through 2015 and for the purposes of that analysis, the data from all three years are considered together as a whole. However, for long-term planning purposes, it may also be useful to consider how hot and cold spots change over time. An emerging hot spot analysis analyzes trends in the data to find new, intensifying, diminishing, and sporadic hot and cold spots.



## Description of Emerging Hot Spot Classifications

- **No Pattern Detected** – Does not fall into any of the hot or cold spot patterns defined below.
- **New Hot Spot** – A location that is a statistically significant hot spot for the final time step and has never been a statistically significant hot spot before.
- **Consecutive Hot Spot** – A location with a single uninterrupted run of statistically significant hot spot bins in the final time-step intervals. The location has never been a statistically significant hot spot prior to the final hot spot run and less than ninety percent of all bins are statistically significant hot spots.
- **Intensifying Hot Spot** – A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of high counts in each time step is increasing overall and that increase is statistically significant.
- **Persistent Hot Spot** – A location that has been a statistically significant hot spot for ninety percent of the time-step intervals with no discernible trend indicating an increase or decrease in the intensity of clustering over time.
- **Diminishing Hot Spot** – A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering in each time step is decreasing overall and that decrease is statistically significant.
- **Sporadic Hot Spot** – A location that is an on-again then off-again hot spot. Less than ninety percent of the time-step intervals have been statistically significant hot spots and none of the time-step intervals have been statistically significant cold spots.
- **Oscillating Hot Spot** – A statistically significant hot spot for the final time-step interval that has a history of also being a statistically significant cold spot during a prior time step. Less than ninety percent of the time-step intervals have been statistically significant hot spots.
- **Historical Hot Spot** – The most recent time period is not hot, but at least ninety percent of the time-step intervals have been statistically significant hot spots.

## Description of Emerging Hot Spot Classifications

- **New Cold Spot** – A location that is a statistically significant cold spot for the final time step and has never been a statistically significant cold spot before.
- **Consecutive Cold Spot** – A location with a single uninterrupted run of statistically significant cold spot bins in the final time-step intervals. The location has never been a statistically significant cold spot prior to the final cold spot run and less than ninety percent of all bins are statistically significant cold spots.
- **Intensifying Cold Spot** – A location that has been a statistically significant cold spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of low counts in each time step is increasing overall and that increase is statistically significant.
- **Persistent Cold Spot** – A location that has been a statistically significant cold spot for ninety percent of the time-step intervals with no discernible trend, indicating an increase or decrease in the intensity of clustering of counts over time.
- **Diminishing Cold Spot** – A location that has been a statistically significant cold spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of low counts in each time step is decreasing overall and that decrease is statistically significant.
- **Sporadic Cold Spot** – A location that is an on-again then off-again cold spot. Less than ninety percent of the time-step intervals have been statistically significant cold spots and none of the time-step intervals have been statistically significant hot spots.
- **Oscillating Cold Spot** – A statistically significant cold spot for the final time-step interval that has a history of also being a statistically significant hot spot during a prior time step. Less than ninety percent of the time-step intervals have been statistically significant cold spots.
- **Historical Cold Spot** – The most recent time period is not cold, but at least ninety percent of the time-step intervals have been statistically significant cold spots.

## PCF Grouping Analysis Results - City-wide

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	526
21950(a,c)	Driver to yield right-of-way at crosswalks	362
21453(a,c)	"Red" signal - vehicular responsibilities	262
22107	Unsafe turn or lane change prohibited	221
21801(a,b)	Violation of right-of-way - left turn	185
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	108
23152	Driving under the influence of alcohol or drug	105
21955	Crossing between controlled intersections (Jaywalking)	104
22517	Opening door on traffic side when unsafe	95
21658(a,b)	Lane straddling/failure to use specified lanes	89
22450(a)	Failure to stop at STOP sign	77
22106	Unsafe starting or backing on highway	65
21802(a,b)	Violation of right-of-way - entering through highway	56
21453(d)	"Red" signal - pedestrian responsibilities	52
21950(b)	Pedestrian right-of-way at crosswalks regulated	47
21703	Following too closely prohibited	46
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	38
21755(a)	Unsafe passing on right shoulder	36
21750	Overtaking and passing unsafely	28
21804(a,b)	Entering highway from alley or driveway	28
21650	Failure to keep to right side of road	27
21956(a)	Pedestrian on roadway prohibited	26
22100(a,b)	Turn at intersection from wrong position	25
22101(d)	Violating special traffic control markers	24
21800(a-d)	Violation of right-of-way	19
21650.1	Bicycle to travel in same direction as vehicles	14
21657	Driving against one-way traffic patterns	12
22103	Illegal U-turn in residential district	12
21202(a)	Bicyclist at less than normal speed must keep to the right	11
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	11
22102	Illegal U-turn in business district	11
21663	Driving on sidewalk prohibited	9
21201(a-d)	Equipment requirements for bicycles	8
21451(a,b)	"Green" signal - vehicular responsibilities	8
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	6



## PCF Grouping Analysis Results - City-wide (continued)

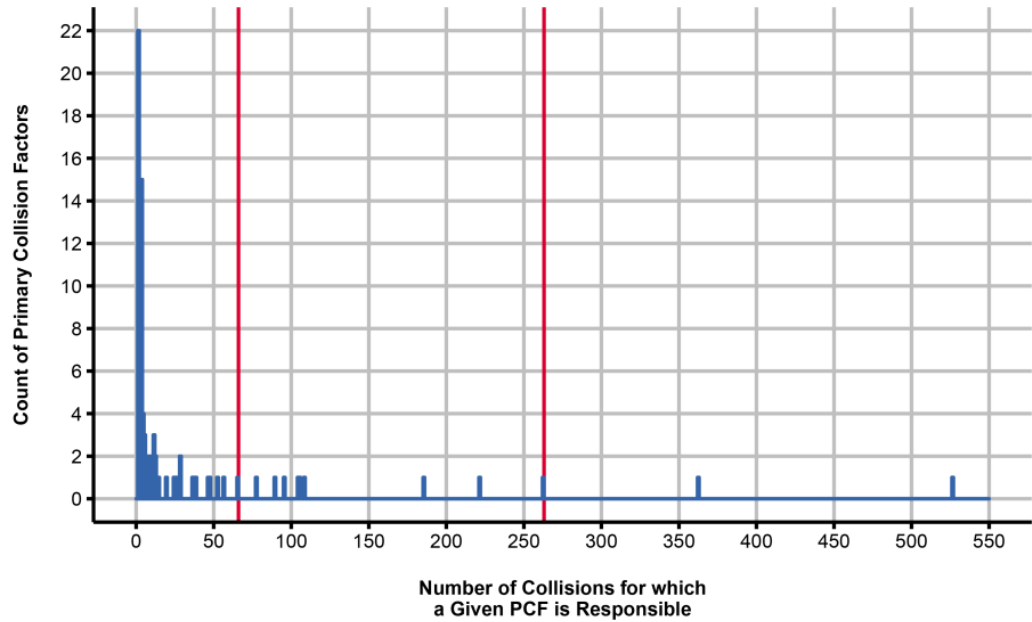
PCF	Description	Count
21453(b)	"Red" signal - vehicular responsibilities with right turn	5
21717	Turning across bicycle lane	5
22400(a,b)	Minimum speed law - impeding traffic flow	5
21209(a)	Motor vehicle in bicycle lane prohibited	4
21461(a)	Driver failure to obey signs/signals	4
21751	Passing without sufficient clearance	4
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	4
20002(a)	Hit and run - property damage	3
21200.5	Bicyclist riding under the influence	3
21461.5	Pedestrian failure to obey signs/signals	3
21651(a)	Driving across dividing section on freeway prohibited	3
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	3
21754	Improper passing on right prohibited	3
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	3
21803(a,b)	Violation of "Yield" sign	3
21806(a,b)	Failure to yield to emergency vehicle	3
21952	Failure to yield right-of-way on sidewalk to pedestrian	3
22105	Illegal U-turn on highway without unobstructed view	3
22109	Sudden stopping without signaling	3
22500	Stopping, standing, parking in prohibited locations	3
23123(a)	Driving while using a wireless telephone not configured for hands-free use	3
7.2.12	Bicycle riding restricted	3
21208(a,b)	Riding outside bicycle lane prohibited	2
21211(a,b)	Illegally impeding bicycle lanes	2
21451(c,d)	"Green" signal - pedestrian responsibilities	2
21712(a)	Allowing riding on portion of vehicle not designed for passenger use prohibited	2
21760(b,c,d)	Improper passing of a bicycle - Three Feet for Safety Act	2
21951	Overtaking vehicles stopped for pedestrians	2
22108	Signal required before turning or changing lanes	2
22348(a)	Driving in excess of the posted speed limit	2

## PCF Grouping Analysis Results - City-wide (continued)

PCF	Description	Count
22352(a)(2)	Operating vehicle in excess of 15 MPH at freeway intersection with no clear field of vision	2
22526(a,b)	Blocking intersection (gridlock) prohibited	2
23109(a-c)	Engaging in or abetting a speed contest or exhibition of speed	2
7.2.35	Parking on grades	2
21106(b)	Use of crosswalks where prohibited by sign	1
21200(a)	Bicycle riding - general rights and responsibilities	1
21204(b)	Riding bicycle on other than a permanent seat	1
21210	Bicycle parked - impeding pedestrian traffic prohibited	1
21281	Improperly equipped assistive mobility device	1
21452(b)	Failure of pedestrian to properly respond to signal of yellow light or arrow	1
21457(a)	Actions required at flashing red signal	1
21462	Failure to obey a traffic control signal	1
21463	No person shall illegally operate signals	1
21651(c)	Willfully driving wrong way on divided highway and causing injury or death	1
21660	Failure of approaching vehicles to pass to the right	1
21708	Running over unprotected fire/chemical hose prohibited	1
21753	Failure to yield to overtaking vehicle	1
21968	Motorized skateboard prohibited	1
22100.5	U-Turn at controlled intersection	1
22351(a,b)	Driving in excess of prima facie speed limits established in VC 22352	1
22360	Violation of local speed limits between business and residence districts	1
24252(a-c)	Maintenance of lamps and devices required	1
2800(a)	Refusal to obey a peace officer	1
2800.2(a)	Fleeing a peace officer - reckless driving	1
7.2.13	Non-motorized user-propelled vehicle - unspecified violation	1
7.2.13(b)	Riding a non-motorized user-propelled vehicle in the roadway	1

## PCF Grouping Analysis Results - City-wide

Distribution of Primary Collision Factors

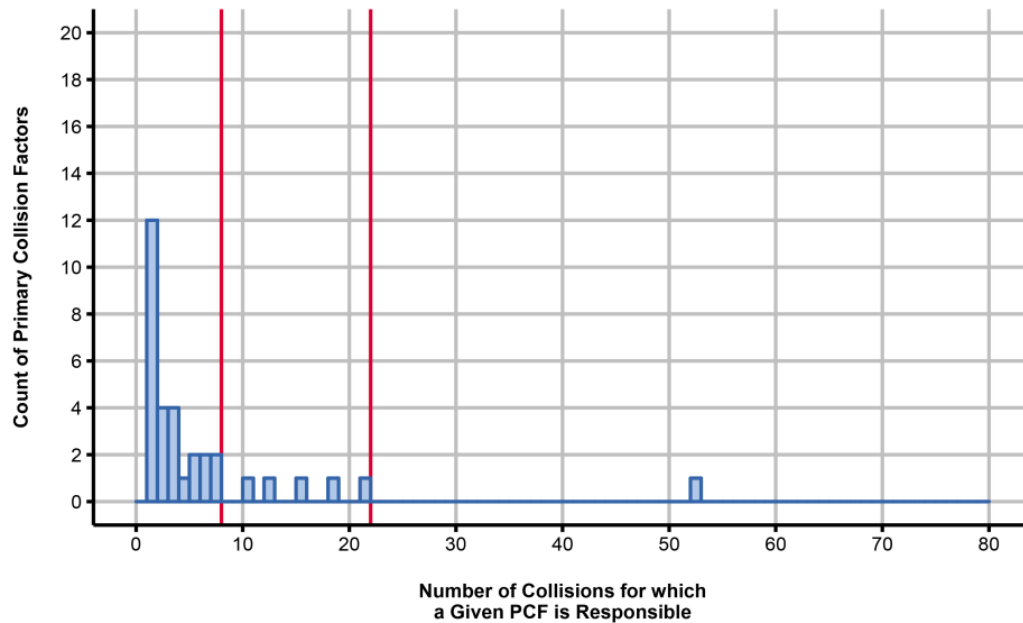


## PCF Grouping Analysis Results - Bayview Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	52
22107	Unsafe turn or lane change prohibited	21
21950(a,c)	Driver to yield right-of-way at crosswalks	18
23152	Driving under the influence of alcohol or drug	15
21453(a,c)	"Red" signal - vehicular responsibilities	12
22450(a)	Failure to stop at STOP sign	10
21801(a,b)	Violation of right-of-way - left turn	7
21955	Crossing between controlled intersections (Jaywalking)	7
21658(a,b)	Lane straddling/failure to use specified lanes	6
21802(a,b)	Violation of right-of-way - entering through highway	6
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22106	Unsafe starting or backing on highway	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21650	Failure to keep to right side of road	3
21750	Overtaking and passing unsafely	3
21755(a)	Unsafe passing on right shoulder	3
21201(a-d)	Equipment requirements for bicycles	2
21800(a-d)	Violation of right-of-way	2
21804(a,b)	Entering highway from alley or driveway	2
21956(a)	Pedestrian on roadway prohibited	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461(a)	Driver failure to obey signs/signals	1
21651(a)	Driving across dividing section on freeway prohibited	1
21712(a)	Allowing riding on portion of vehicle not designed for passenger use prohibited	1
21806(a,b)	Failure to yield to emergency vehicle	1
21950(b)	Pedestrian right-of-way at crosswalks regulated	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
22102	Illegal U-turn in business district	1
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	1
22517	Opening door on traffic side when unsafe	1
23123(a)	Driving while using a wireless telephone not configured for hands-free use	1

## PCF Grouping Analysis Results - Bayview Police District

Distribution of Primary Collision Factors



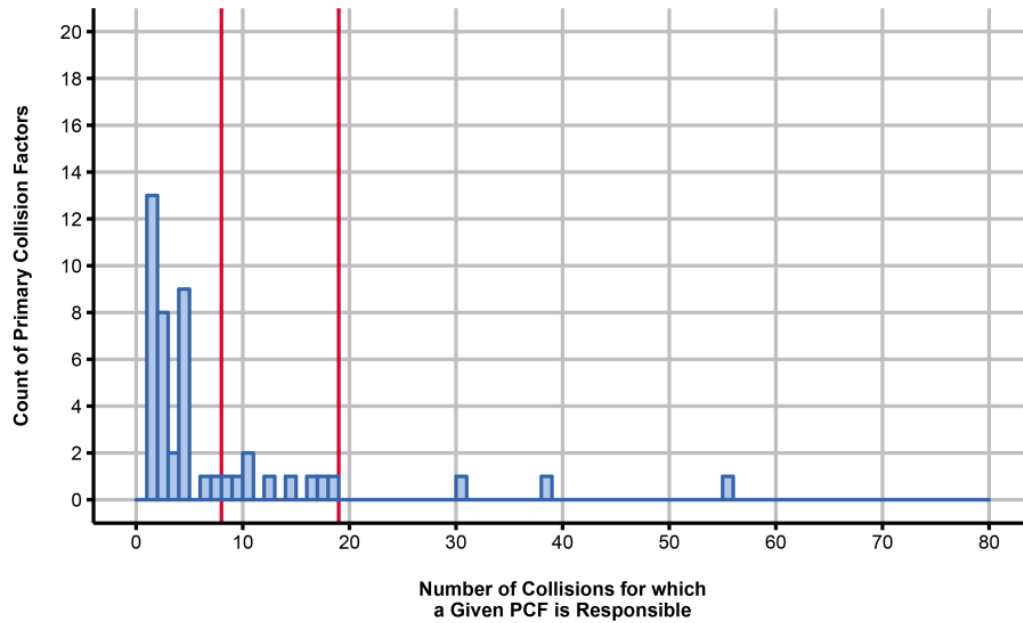
## PCF Grouping Analysis Results - Central Police District

PCF	Description	Count
21950(a,c)	Driver to yield right-of-way at crosswalks	55
22350	Unsafe speed for prevailing conditions	38
21453(a,c)	"Red" signal - vehicular responsibilities	30
21955	Crossing between controlled intersections (Jaywalking)	18
22107	Unsafe turn or lane change prohibited	17
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	16
22517	Opening door on traffic side when unsafe	14
21658(a,b)	Lane straddling/failure to use specified lanes	12
21801(a,b)	Violation of right-of-way - left turn	10
23152	Driving under the influence of alcohol or drug	10
21950(b)	Pedestrian right-of-way at crosswalks regulated	9
22106	Unsafe starting or backing on highway	8
21755(a)	Unsafe passing on right shoulder	7
21703	Following too closely prohibited	6
21202(a)	Bicyclist at less than normal speed must keep to the right	4
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	4
21750	Overtaking and passing unsafely	4
21802(a,b)	Violation of right-of-way - entering through highway	4
21804(a,b)	Entering highway from alley or driveway	4
21956(a)	Pedestrian on roadway prohibited	4
22100(a,b)	Turn at intersection from wrong position	4
22450(a)	Failure to stop at STOP sign	4
21657	Driving against one-way traffic patterns	3
22400(a,b)	Minimum speed law - impeding traffic flow	3
21453(b)	"Red" signal - vehicular responsibilities with right turn	2
21650	Failure to keep to right side of road	2
21650.1	Bicycle to travel in same direction as vehicles	2
21663	Driving on sidewalk prohibited	2
21800(a-d)	Violation of right-of-way	2
22101(d)	Violating special traffic control markers	2
22102	Illegal U-turn in business district	2
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	2
21200.5	Bicyclist riding under the influence	1
21201(a-d)	Equipment requirements for bicycles	1
21208(a,b)	Riding outside bicycle lane prohibited	1

21451(a,b)	"Green" signal - vehicular responsibilities	1
21451(c,d)	"Green" signal - pedestrian responsibilities	1
21712(a)	Allowing riding on portion of vehicle not designed for passenger use prohibited	1
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	1
21760(b,c,d)	Improper passing of a bicycle - Three Feet for Safety Act	1
21952	Failure to yield right-of-way on sidewalk to pedestrian	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
22348(a)	Driving in excess of the posted speed limit	1
22526(a,b)	Blocking intersection (gridlock) prohibited	1
23123(a)	Driving while using a wireless telephone not configured for hands-free use	1

## PCF Grouping Analysis Results - Central Police District

### Distribution of Primary Collision Factors



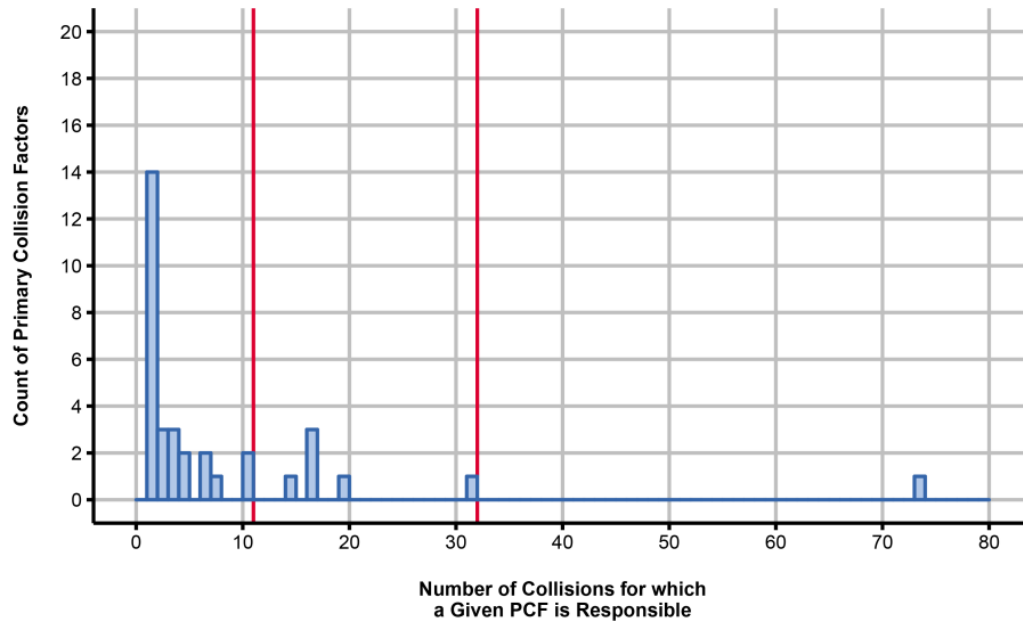
## PCF Grouping Analysis Results - Ingleside Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	73
21950(a,c)	Driver to yield right-of-way at crosswalks	31
21453(a,c)	"Red" signal - vehicular responsibilities	19
21801(a,b)	Violation of right-of-way - left turn	16
22107	Unsafe turn or lane change prohibited	16
23152	Driving under the influence of alcohol or drug	16
22450(a)	Failure to stop at STOP sign	14
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	10
21955	Crossing between controlled intersections (Jaywalking)	10
21658(a,b)	Lane straddling/failure to use specified lanes	7
21802(a,b)	Violation of right-of-way - entering through highway	6
22106	Unsafe starting or backing on highway	6
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	4
21804(a,b)	Entering highway from alley or driveway	4
21650	Failure to keep to right side of road	3
21950(b)	Pedestrian right-of-way at crosswalks regulated	3
22517	Opening door on traffic side when unsafe	3
21201(a-d)	Equipment requirements for bicycles	2
21703	Following too closely prohibited	2
22100(a,b)	Turn at intersection from wrong position	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21208(a,b)	Riding outside bicycle lane prohibited	1
21750	Overtaking and passing unsafely	1
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	1
21800(a-d)	Violation of right-of-way	1
21806(a,b)	Failure to yield to emergency vehicle	1
21956(a)	Pedestrian on roadway prohibited	1
22101(d)	Violating special traffic control markers	1
22102	Illegal U-turn in business district	1
22103	Illegal U-turn in residential district	1
22352(a)(2)	Operating vehicle in excess of 15 MPH at freeway intersection with no clear field of vision	1
22500	Stopping, standing, parking in prohibited locations	1
2800.2(a)	Fleeing a peace officer - reckless driving	1
7.2.35	Parking on grades	1



## PCF Grouping Analysis Results - Ingleside Police District

### Distribution of Primary Collision Factors



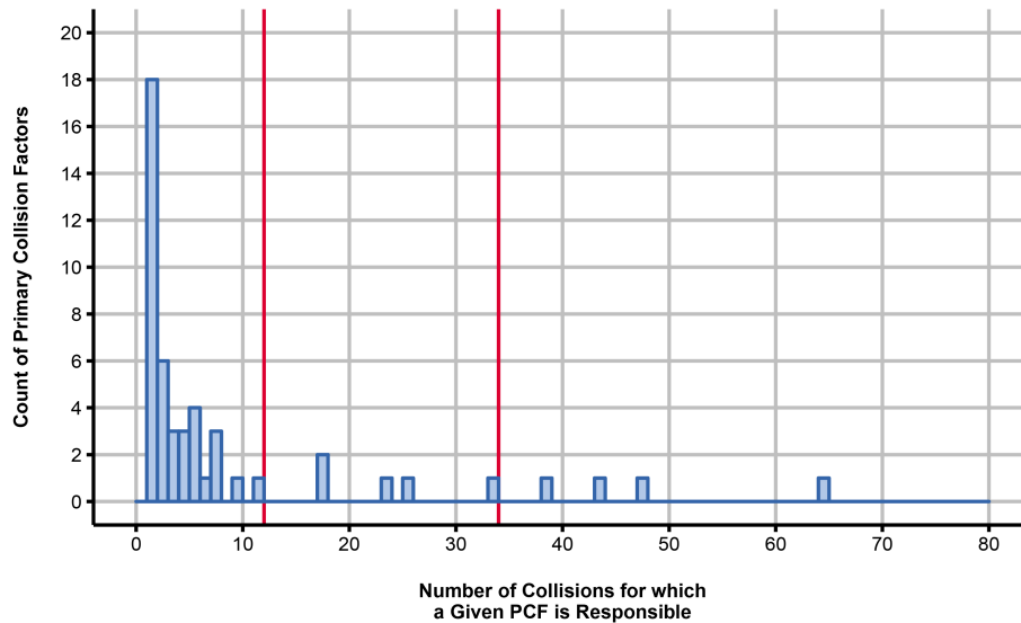
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	64
21801(a,b)	Violation of right-of-way - left turn	47
22107	Unsafe turn or lane change prohibited	43
21950(a,c)	Driver to yield right-of-way at crosswalks	38
21453(a,c)	"Red" signal - vehicular responsibilities	33
22517	Opening door on traffic side when unsafe	25
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	23
21955	Crossing between controlled intersections (Jaywalking)	17
23152	Driving under the influence of alcohol or drug	17
22106	Unsafe starting or backing on highway	11
22450(a)	Failure to stop at STOP sign	9
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	7
21658(a,b)	Lane straddling/failure to use specified lanes	7
21755(a)	Unsafe passing on right shoulder	7
21453(d)	"Red" signal - pedestrian responsibilities	6
21703	Following too closely prohibited	5
21802(a,b)	Violation of right-of-way - entering through highway	5
21804(a,b)	Entering highway from alley or driveway	5
21950(b)	Pedestrian right-of-way at crosswalks regulated	5
21451(a,b)	"Green" signal - vehicular responsibilities	4
21750	Overtaking and passing unsafely	4
21956(a)	Pedestrian on roadway prohibited	4
21209(a)	Motor vehicle in bicycle lane prohibited	3
21650	Failure to keep to right side of road	3
21663	Driving on sidewalk prohibited	3
21650.1	Bicycle to travel in same direction as vehicles	2
21717	Turning across bicycle lane	2
22100(a,b)	Turn at intersection from wrong position	2
22101(d)	Violating special traffic control markers	2
22102	Illegal U-turn in business district	2
22103	Illegal U-turn in residential district	2
20002(a)	Hit and run - property damage	1
21211(a,b)	Illegally impeding bicycle lanes	1
21457(a)	Actions required at flashing red signal	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21708	Running over unprotected fire/chemical hose prohibited	1
21751	Passing without sufficient clearance	1

## PCF Grouping Analysis Results - Mission Police District

21754	Improper passing on right prohibited	1
21800(a-d)	Violation of right-of-way	1
21803(a,b)	Violation of "Yield" sign	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
22105	Illegal U-turn on highway without unobstructed view	1
22109	Sudden stopping without signaling	1
22348(a)	Driving in excess of the posted speed limit	1
22352(a)(2)	Operating vehicle in excess of 15 MPH at freeway intersection with no clear field of vision	1
22500	Stopping, standing, parking in prohibited locations	1
24252(a-c)	Maintenance of lamps and devices required	1
7.2.12	Bicycle riding restricted	1
7.2.13	Non-motorized user-propelled vehicle - unspecified violation	1

## PCF Grouping Analysis Results - Mission Police District

Distribution of Primary Collision Factors



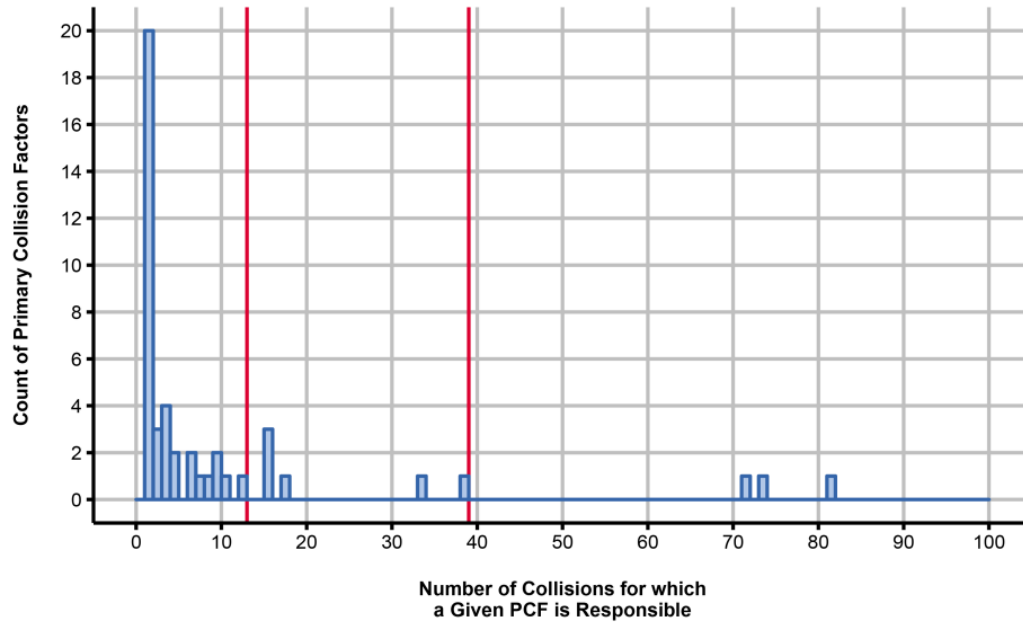
PCF	Description	Count
21453(a,c)	"Red" signal - vehicular responsibilities	81
22350	Unsafe speed for prevailing conditions	73
21950(a,c)	Driver to yield right-of-way at crosswalks	71
22107	Unsafe turn or lane change prohibited	38
21801(a,b)	Violation of right-of-way - left turn	33
21453(d)	"Red" signal - pedestrian responsibilities	17
22450(a)	Failure to stop at STOP sign	15
22517	Opening door on traffic side when unsafe	15
23152	Driving under the influence of alcohol or drug	15
21955	Crossing between controlled intersections (Jaywalking)	12
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	10
21658(a,b)	Lane straddling/failure to use specified lanes	9
22106	Unsafe starting or backing on highway	9
21950(b)	Pedestrian right-of-way at crosswalks regulated	8
21755(a)	Unsafe passing on right shoulder	7
21703	Following too closely prohibited	6
22100(a,b)	Turn at intersection from wrong position	6
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	4
21650	Failure to keep to right side of road	4
21657	Driving against one-way traffic patterns	3
21750	Overtaking and passing unsafely	3
22101(d)	Violating special traffic control markers	3
22103	Illegal U-turn in residential district	3
21800(a-d)	Violation of right-of-way	2
21802(a,b)	Violation of right-of-way - entering through highway	2
21956(a)	Pedestrian on roadway prohibited	2
21200(a)	Bicycle riding - general rights and responsibilities	1
21201(a-d)	Equipment requirements for bicycles	1
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21451(a,b)	"Green" signal - vehicular responsibilities	1
21452(b)	Failure of pedestrian to properly respond to signal of yellow light or arrow	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461(a)	Driver failure to obey signs/signals	1
21650.1	Bicycle to travel in same direction as vehicles	1
21651(a)	Driving across dividing section on freeway prohibited	1

## PCF Grouping Analysis Results - Northern Police District

21717	Turning across bicycle lane	1
21751	Passing without sufficient clearance	1
21804(a,b)	Entering highway from alley or driveway	1
21952	Failure to yield right-of-way on sidewalk to pedestrian	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
21968	Motorized skateboard prohibited	1
22108	Signal required before turning or changing lanes	1
22351(a,b)	Driving in excess of prima facie speed limits established in VC 22352	1
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	1
23109(a-c)	Engaging in or abetting a speed contest or exhibition of speed	1
7.2.12	Bicycle riding restricted	1

## PCF Grouping Analysis Results - Northern Police District

Distribution of Primary Collision Factors

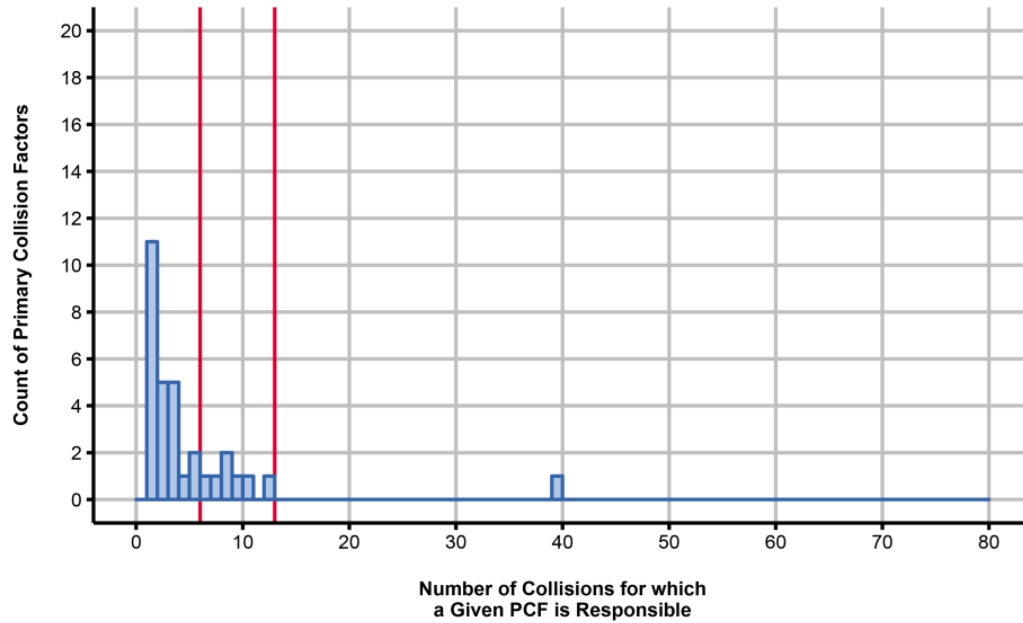


## PCF Grouping Analysis Results - Park Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	39
21950(a,c)	Driver to yield right-of-way at crosswalks	12
21453(a,c)	"Red" signal - vehicular responsibilities	10
21703	Following too closely prohibited	9
21658(a,b)	Lane straddling/failure to use specified lanes	8
22106	Unsafe starting or backing on highway	8
22107	Unsafe turn or lane change prohibited	7
21955	Crossing between controlled intersections (Jaywalking)	6
21750	Overtaking and passing unsafely	5
21801(a,b)	Violation of right-of-way - left turn	5
22517	Opening door on traffic side when unsafe	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21802(a,b)	Violation of right-of-way - entering through highway	3
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	3
22450(a)	Failure to stop at STOP sign	3
23152	Driving under the influence of alcohol or drug	3
21453(d)	"Red" signal - pedestrian responsibilities	2
21755(a)	Unsafe passing on right shoulder	2
21800(a-d)	Violation of right-of-way	2
21950(b)	Pedestrian right-of-way at crosswalks regulated	2
21956(a)	Pedestrian on roadway prohibited	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21211(a,b)	Illegally impeding bicycle lanes	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21462	Failure to obey a traffic control signal	1
21650	Failure to keep to right side of road	1
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	1
22103	Illegal U-turn in residential district	1
22105	Illegal U-turn on highway without unobstructed view	1
22360	Violation of local speed limits between business and residence districts	1
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	1
7.2.35	Parking on grades	1

## PCF Grouping Analysis Results - Park Police District

Distribution of Primary Collision Factors



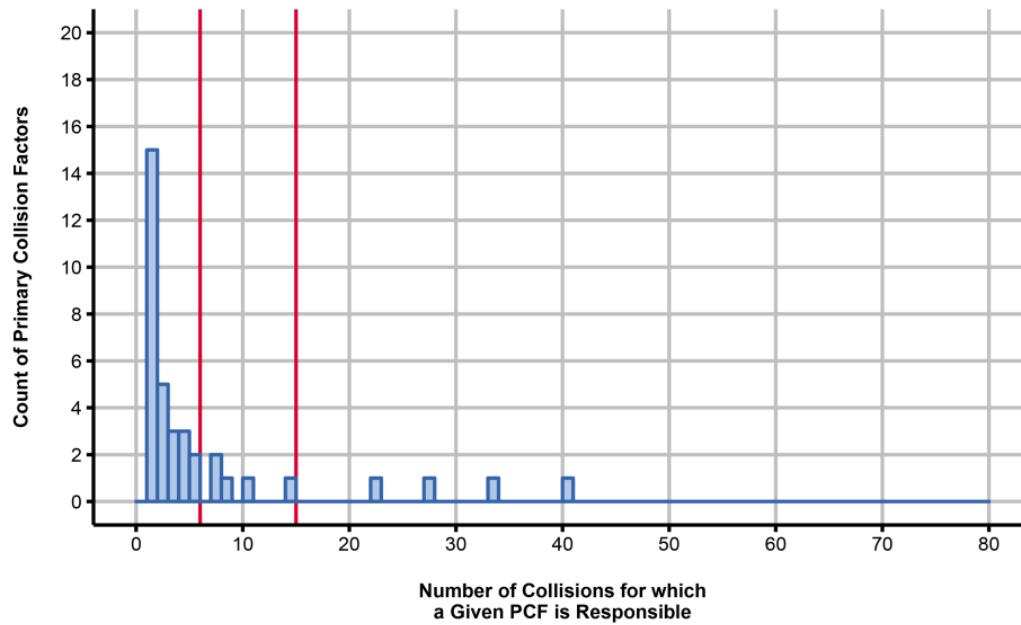
## PCF Grouping Analysis Results - Richmond Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	40
21950(a,c)	Driver to yield right-of-way at crosswalks	33
21801(a,b)	Violation of right-of-way - left turn	27
22107	Unsafe turn or lane change prohibited	22
21453(a,c)	"Red" signal - vehicular responsibilities	14
21802(a,b)	Violation of right-of-way - entering through highway	10
22517	Opening door on traffic side when unsafe	8
21658(a,b)	Lane straddling/failure to use specified lanes	7
23152	Driving under the influence of alcohol or drug	7
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22450(a)	Failure to stop at STOP sign	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21800(a-d)	Violation of right-of-way	4
21804(a,b)	Entering highway from alley or driveway	4
21950(b)	Pedestrian right-of-way at crosswalks regulated	3
21955	Crossing between controlled intersections (Jaywalking)	3
22106	Unsafe starting or backing on highway	3
21650	Failure to keep to right side of road	2
21717	Turning across bicycle lane	2
21750	Overtaking and passing unsafely	2
22100(a,b)	Turn at intersection from wrong position	2
22103	Illegal U-turn in residential district	2
21281	Improperly equipped assistive mobility device	1
21451(a,b)	"Green" signal - vehicular responsibilities	1
21451(c,d)	"Green" signal - pedestrian responsibilities	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461.5	Pedestrian failure to obey signs/signals	1
21650.1	Bicycle to travel in same direction as vehicles	1
21703	Following too closely prohibited	1
21751	Passing without sufficient clearance	1
21754	Improper passing on right prohibited	1
21755(a)	Unsafe passing on right shoulder	1
21803(a,b)	Violation of "Yield" sign	1
21951	Overtaking vehicles stopped for pedestrians	1
21952	Failure to yield right-of-way on sidewalk to pedestrian	1
21956(a)	Pedestrian on roadway prohibited	1
22101(d)	Violating special traffic control markers	1



## PCF Grouping Analysis Results - Richmond Police District

Distribution of Primary Collision Factors



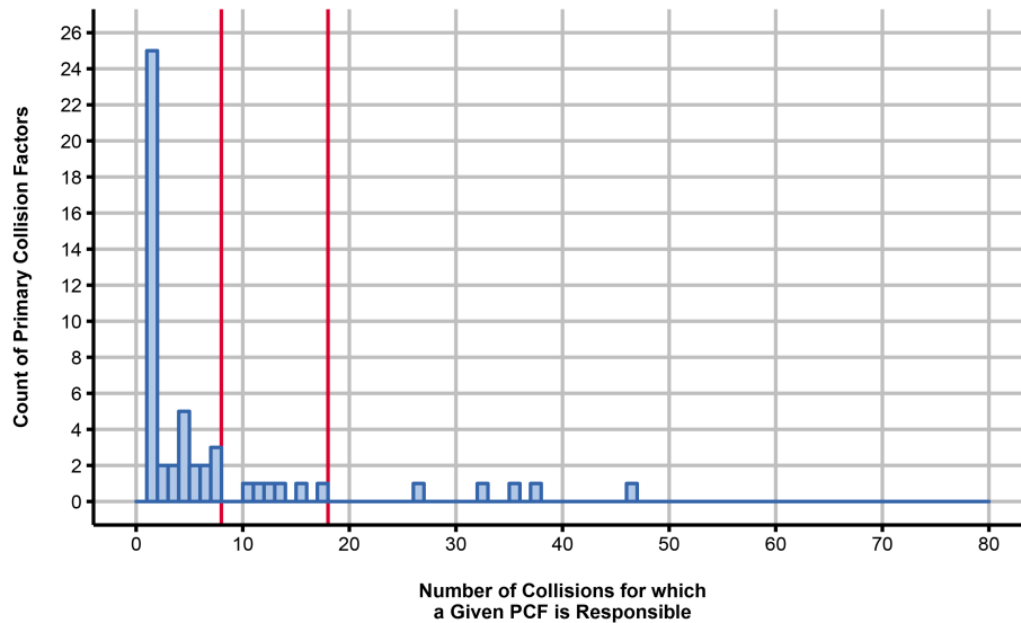
## PCF Grouping Analysis Results - Southern Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	46
21453(a,c)	"Red" signal - vehicular responsibilities	37
21950(a,c)	Driver to yield right-of-way at crosswalks	35
22107	Unsafe turn or lane change prohibited	32
21801(a,b)	Violation of right-of-way - left turn	26
22517	Opening door on traffic side when unsafe	17
21658(a,b)	Lane straddling/failure to use specified lanes	15
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	13
22101(d)	Violating special traffic control markers	12
23152	Driving under the influence of alcohol or drug	11
21955	Crossing between controlled intersections (Jaywalking)	10
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	7
21650	Failure to keep to right side of road	7
21755(a)	Unsafe passing on right shoulder	7
21703	Following too closely prohibited	6
22100(a,b)	Turn at intersection from wrong position	6
21453(d)	"Red" signal - pedestrian responsibilities	5
21650.1	Bicycle to travel in same direction as vehicles	5
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	4
21804(a,b)	Entering highway from alley or driveway	4
21950(b)	Pedestrian right-of-way at crosswalks regulated	4
22102	Illegal U-turn in business district	4
22106	Unsafe starting or backing on highway	4
21657	Driving against one-way traffic patterns	3
21956(a)	Pedestrian on roadway prohibited	3
20002(a)	Hit and run - property damage	2
21802(a,b)	Violation of right-of-way - entering through highway	2
21106(b)	Use of crosswalks where prohibited by sign	1
21201(a-d)	Equipment requirements for bicycles	1
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21204(b)	Riding bicycle on other than a permanent seat	1
21209(a)	Motor vehicle in bicycle lane prohibited	1
21210	Bicycle parked - impeding pedestrian traffic prohibited	1
21453(b)	"Red" signal - vehicular responsibilities with right turn	1
21461(a)	Driver failure to obey signs/signals	1
21461.5	Pedestrian failure to obey signs/signals	1
21660	Failure of approaching vehicles to pass to the right	1

21663	Driving on sidewalk prohibited	1
21750	Overtaking and passing unsafely	1
21753	Failure to yield to overtaking vehicle	1
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	1
21800(a-d)	Violation of right-of-way	1
21803(a,b)	Violation of "Yield" sign	1
22100.5	U-Turn at controlled intersection	1
22108	Signal required before turning or changing lanes	1
22400(a,b)	Minimum speed law - impeding traffic flow	1
22450(a)	Failure to stop at STOP sign	1
22500	Stopping, standing, parking in prohibited locations	1
23109(a-c)	Engaging in or abetting a speed contest or exhibition of speed	1
23123(a)	Driving while using a wireless telephone not configured for hands-free use	1
2800(a)	Refusal to obey a peace officer	1
7.2.12	Bicycle riding restricted	1

## PCF Grouping Analysis Results - Southern Police District

Distribution of Primary Collision Factors



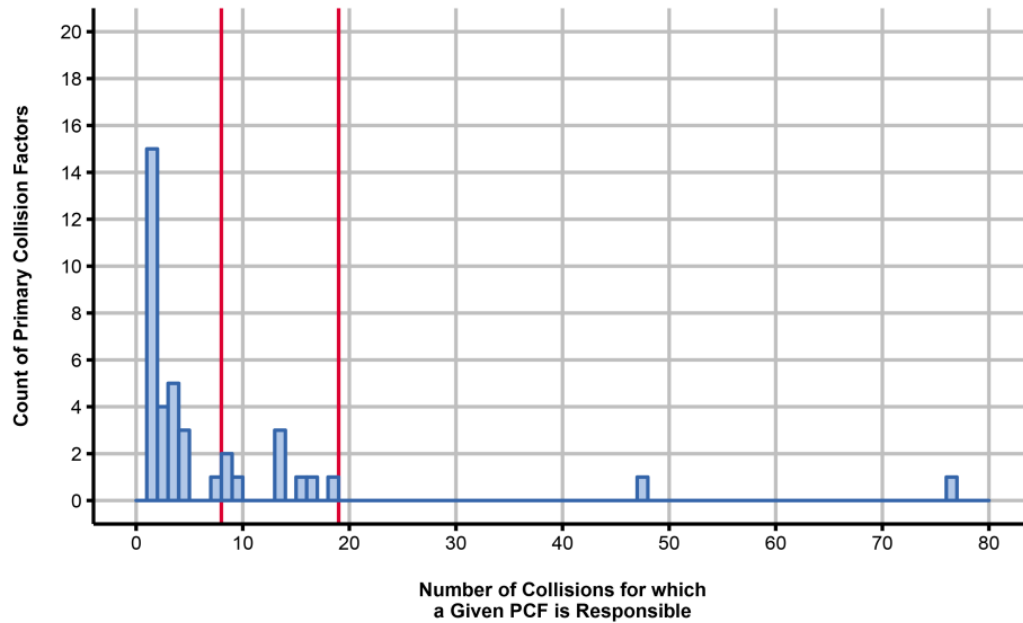
## PCF Grouping Analysis Results - Taraval Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	76
21950(a,c)	Driver to yield right-of-way at crosswalks	47
21802(a,b)	Violation of right-of-way - entering through highway	18
22450(a)	Failure to stop at STOP sign	16
22107	Unsafe turn or lane change prohibited	15
21658(a,b)	Lane straddling/failure to use specified lanes	13
21801(a,b)	Violation of right-of-way - left turn	13
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	13
21703	Following too closely prohibited	9
21453(a,c)	"Red" signal - vehicular responsibilities	8
23152	Driving under the influence of alcohol or drug	8
21950(b)	Pedestrian right-of-way at crosswalks regulated	7
21955	Crossing between controlled intersections (Jaywalking)	4
21956(a)	Pedestrian on roadway prohibited	4
22106	Unsafe starting or backing on highway	4
21453(d)	"Red" signal - pedestrian responsibilities	3
21650.1	Bicycle to travel in same direction as vehicles	3
21750	Overtaking and passing unsafely	3
21800(a-d)	Violation of right-of-way	3
22103	Illegal U-turn in residential district	3
21650	Failure to keep to right side of road	2
21657	Driving against one-way traffic patterns	2
21804(a,b)	Entering highway from alley or driveway	2
22100(a,b)	Turn at intersection from wrong position	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21451(a,b)	"Green" signal - vehicular responsibilities	1
21453(b)	"Red" signal - vehicular responsibilities with right turn	1
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461(a)	Driver failure to obey signs/signals	1
21651(a)	Driving across dividing section on freeway prohibited	1
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	1
21806(a,b)	Failure to yield to emergency vehicle	1
21951	Overtaking vehicles stopped for pedestrians	1
22101(d)	Violating special traffic control markers	1
22105	Illegal U-turn on highway without unobstructed view	1
22109	Sudden stopping without signaling	1

22526(a,b)	Blocking intersection (gridlock) prohibited	1
7.2.13(b)	Riding a non-motorized user-propelled vehicle in the roadway	1

## PCF Grouping Analysis Results - Taraval Police District

Distribution of Primary Collision Factors



## PCF Grouping Analysis Results - Tenderloin Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	25
21950(a,c)	Driver to yield right-of-way at crosswalks	22
21453(a,c)	"Red" signal - vehicular responsibilities	18
21955	Crossing between controlled intersections (Jaywalking)	16
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	10
22107	Unsafe turn or lane change prohibited	10
22517	Opening door on traffic side when unsafe	8
21453(d)	"Red" signal - pedestrian responsibilities	7
22106	Unsafe starting or backing on highway	7
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	5
21658(a,b)	Lane straddling/failure to use specified lanes	5
21950(b)	Pedestrian right-of-way at crosswalks regulated	5
21663	Driving on sidewalk prohibited	3
21956(a)	Pedestrian on roadway prohibited	3
23152	Driving under the influence of alcohol or drug	3
21200.5	Bicyclist riding under the influence	2
21703	Following too closely prohibited	2
21750	Overtaking and passing unsafely	2
21755(a)	Unsafe passing on right shoulder	2
21804(a,b)	Entering highway from alley or driveway	2
22101(d)	Violating special traffic control markers	2
21201(a-d)	Equipment requirements for bicycles	1
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21453(b)	"Red" signal - vehicular responsibilities with right turn	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461.5	Pedestrian failure to obey signs/signals	1
21463	No person shall illegally operate signals	1
21651(c)	Willfully driving wrong way on divided highway and causing injury or death	1
21657	Driving against one-way traffic patterns	1
21751	Passing without sufficient clearance	1
21754	Improper passing on right prohibited	1
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	1
21760(b,c,d)	Improper passing of a bicycle - Three Feet for Safety Act	1
21800(a-d)	Violation of right-of-way	1
21801(a,b)	Violation of right-of-way - left turn	1
22100(a,b)	Turn at intersection from wrong position	1

22102	Illegal U-turn in business district	1
22109	Sudden stopping without signaling	1
22400(a,b)	Minimum speed law - impeding traffic flow	1

## PCF Grouping Analysis Results - Tenderloin Police District

Distribution of Primary Collision Factors

